Family STOMIATIDAE

Body very low, elongate and tapering, compressed. Head oblong. Snout short, rounded. Eye variably large or small, far advanced. Mouth very large, with deep lateral cleft. Lower jaw and hyoid arch joined by membrane forming mouth floor. Pair of relatively short muscles connects mandibular symphysis with ceratohyals. Lateral edge of upper jaw formed by maxillary, toothed. Teeth usually strong, unequal, some often fang like or barbed. Long barbel at throat. Opercles imperfect. Gill membranes not united, free from isthmus. No pseudobranchiae. Branchiostegals 12 to 17. Skeleton feebly ossified. Stomach coecal. No pyloric appendages. Eggs excluded through oviducts. Body naked or covered with thin deciduous scales. Luminous organs in separated series; opercular, subocular or or postocular ~~m~~ bodies may occur, or some between branchiostegal rays; on body complete double row of photophores from isthmus to caudal and shorter lateral row each side of less extent. Dorsal short or long, median or posterior, inserted before or behind ventrals. Anal long or short, like dorsal ends short space from caudal. Caudal forked, lobes often unequal. Pectorals low, or absent. Ventrals well developed to long, mostly postmedian.

A large family of luminous deep sea fishes, remarkable chiefly for their enormous fangs and very distensible stomachs, which enable them to swallow fishes larger than themselves. They have recently been the subject of an exhaustive study by Regan and Trewavas, whose definitions are largely accepted in this report. The barbel attached to the under surface of the head is the principal organ used pointing out specific distinctions. Its extreme and varied modifications are almost endless, though functioning perhaps as sensory or tactile, or even as a lure.

The following are larval forms:

Genus STYLOPHTHALMUS Brauer

Stylophthalmus BRAUER, Zool. Anzeiger, vol.25, 1902, p.298. Type Stylophthalmus paradoxus BRAUER, monotypic.

Body elongate. Head depressed. Snout long, strongly depressed, broadly rounded. Eyes in very young on long immovable cartilaginous stalks, reduced with age. Lower jaw prominent, articular end angularly conspicuous. Teeth in jaws minute, sharp. Body scaleless. Ventral series of luminous organs along body. Dorsal origin before vertical through vent, nearly or not opposite anal. Caudla forked or rounded. Pectorals short, rather broad. No ventrals. Vent on papilla, near anal. Colorless, except for presence of lateral row of chromatophores.

Minute, larval stomiatids.

Stylophthalmus braueri Weber

Stylophthalmus braueri WEBER, Siboga Exped., vol.57, Fische, 1913, p.16, figs. 1 - 2. North of Salomakie, Dammar Island; Banda Sea, in 750 meters. - WEBER and BEAUFORT, Fishes Indo Austral. Archipelago, vol.2, 1913, p.138, figs. 51 - 52 (types).

Stylophthalmus paradoxus Brauer

Stylophthalmus paradoxus BRAUER, Zool. Anzeiger, vol.25, 1902, p.298. South of Cape Colony, Antarctic Sea, Indian Ocean; Deutsch. Tiefsee Exped. Valdivia, vol.5, Tiefsee-Fische, 1906, p.67, pl.5, figs. 1-7 West coast South Africa, south of Cape Colony, Antarctic Sea east of Bouvet Island, Bay of Bengal, between Ceylon and Zanzibar, in 1500 to 4000 meters). - BEEBE, Zoologica N.Y. Zool. Soc., vol.12, No.1, April 30, 1929, p.9 (N. 39° 15' W. 72°, 600 fathoms, 125 miles south east of New York).

ANALYSIS OF GENERA

1
a. Scales present; premaxillary free from maxillary

Stomias.

1
b. Depth 7 1/2 to 13.
2
b. Depth 18 Macrostomias.

a. No scales.

1
c. Pectoral arch attached to skull by post-temporal bone; parietals present; teeth fixed, with long palatine series; dorsal and anal subequal.

1
d. Postocular organ large; an adipose fin Elapterostomias.
2
d. Postocular organ minute; an adipose fin Chirostomias.
3
d. Postocular very large; no adipose fin Trigonolampa.
2

c. Pectoral arch without post-temporal; parietals present; lower jaw with strong fixed fang anteriorly and 1 depressible tooth behind; second upper tooth long fang; pair of teeth on vomer; 0 - 2 teeth on each palatine.

1
e. Second premaxillary tooth fixed in adult.

1
f. No isolated pectoral ray; fangs of lower jaw not penetrating premaxillaries when mouth closes Odontostomias.
2
f. An isolated and produced pectoral ray.

1
g. Anal origin below dorsal origin Opostomias.
2
g. Anal origin before dorsal origin. Flagellostomias.

2
e. Second premaxillary tooth depressible.

1
h. An isolated and produced pectoral ray; anal origin before dorsal origin Thysanactis.
2
h. No isolated pectoral ray; anal origin nearly below dorsal origin Leptostomias.

3
c. No post-temporals; parietals absent.
1
i. Vomer toothless.
1
j. Dorsal and anal subequal; upper jaw not protractile; teeth on palatines.
1
k. First lower tooth fixed, followed by 1 or 2 smaller outer fixed teeth and series of depressible teeth.
1
l. Front fangs long; ventral fins ventral; no luminous lateral loop Grammatostomias.
2
l. Front fangs long; ventral fins ventral; closed loop of luminous tissue on each side of front part of body Lamprotoxus.
3
l. Fangs small; ventral fins lateral Bathophilus.
2
k. Teeth small, fixed; 2 luminous bodies below eye Pachystomias.
2
j. Anal longer than dorsal; upper jaw protractile.
1
m. Palatines toothless Eustomias.
2
m Palatines with 3 groups of short teeth Microdontostomias.
2
i. Pair of teeth on vomer; premaxillary and mandibular fangs all depressible.
1
n. Teeth without or with rudimentary cusp; dorsal and anal subequal.
1
o. Five small teeth on each palatine Hoplostomias.
2
o. Two or three small teeth on each palatine Pseudeustomias.

2n. Teeth bicuspid; dorsal and anal subequal.

1p. Mouth cleft straight.

1q. No isolated pectoral pectoral ray

Melanostomias.

2q. An isolated produced pectoral ray

Echiostoma.

2p. Mouth cleft curved, lower jaw prominent

Photonectes.

3n. Teeth bicuspid; dorsal longer than anal; body very elongate

Idiacanthus.

Genus STOMIAS Oken

Stomias OKEN, Isis, 1817, p.1182. (In Stomias CUVIER, Règne Animal, vol.2, 1817, p.184. Type Esox boa RISSO, monotypic.)

Body elongate, compressed. Head compressed. Snout very short. Eye moderate. Mouth cleft extremely large, oblique, lower jaw projects. Teeth pointed, unequal, very large on premaxillaries and mandible, fine on maxillaries. Vomer with pair of fangs. Palatines and tongue with smaller pointed teeth. Opercular region short. Gill openings very wide. No pyloric appendages. Body covered with exceedingly fine deciduous scales, scarcely imbricated, in subhexagonal depressions in skin. Lower side of body, head and tail with series of photophores. Dorsal rather long, far postmedian, opposite anal. Caudal moderate. Paired fins rather small, short, latter far postmedian.

The following imperfectly described and doubtful:

Stomias variegatus Lesson

Stomias variegatus LESSON, Voy. Coquille, Zool., vol.2, pt.1, 1830, p.142. Baie Soledad, aux iles Malouines. - FOWLER, Mem. Bishop Mus., vol.10, 1928, p.33 (copied).

ANALYSIS OF SPECIES

1a. Premaxillaries with 4 to 7 teeth, larger or equal dentary teeth.

1b. Ventral row of photophores 42 to 47 between pectoral and ventral, 5 to 6 between ventral and anal affinis.

2b. Ventral row of photophores 39 to 51 between pectoral and ventral, 8 to 12 between ventral and anal; scales less than 80.

1d. Depth 9 3/4 to 13; head 7 to 11.

1e. A. 21 to 24; scales 65 to 67; ventral photophores 39 to 51 between pectoral and ventral, 8 to 11 between ventral and anal, 14 from anal origin to caudal colubrinus.

2e. A. 18 or 19; scales 75; ventral photophores 41 to 45 between pectoral and ventral, 9 to 12 between ventral and anal, 14 to 16 from anal origin to caudal atriventer.

3e. A. 21 or 22; scales 73 to 78; ventral photophores 46 to 51 between pectoral and ventral, 10 to 13 between ventral and anal, 15 to 18 between anal origin and caudal.

1f. Barbel with thick spindle shaped stem; only 2 terminal tentacles fusus.

2f. Barbel with slender stem; 3 terminal tentacles boa.

2d. Depth 8; head 6 1/4; A. 23 or 24; ventral photophores 39 between

ventral, 9 between ventral and anal hexagonatus.

3
b. Ventral photophores 33 to 35 between pectoral and ventral, 12 or 13 between ventral and anal; depth 9 to 10; head 8 to 9; A. 19 or 20 brevibarbatus.

4
b. Ventral photophores 54 between pectoral and ventral, 14 between ventral and anal; depth 12 1/2; head 9 1/3; A. 18 gracilis.

2
a. Premaxillary teeth more numerous and conspicuously smaller than those of dentaries nebulosus.

Stomias affinis Günther

Stomias affinis GÜNTHER, Rep. Voy. Challenger, vol.22, 1887, p.205, pl.54, fig.A. South of Sombrero, 450 fathoms. - GOODE and BEAN, Oceanic Ichth., 1895, p.108, pl.34, fig.129 (copied). - JORDAN and EVERMANN, Bull. U.S.Nat. Mus., No.47, pt.1, 1896, p.588 (copied). - GARMAN, Mem. Mus. Comp. Zool., vol.24, 1899, p.275 (diagnosis). - BRAUER, Deutsch Tiefsee Exped. Valdivia, vol.15, Tiefsee-Fische, 1906, p.51 (N. 13° 2' 8" E. 46° 41' 8", 1200 meters, Gulf of Aden). - PAPPENHEIM, Deutsch. Südpolar Exped., vol.15, pt.2, 1914, p.169 (N. 0° 29' W. 18° 57', 10 meters; N. 0° 12' W. 16° 39', 10 meters). - NORMAN, Discovery Rep., vol.2, 1930, p.315 (S. 5° 54' E. 11° 19', 150 meters; S. 00° 36' E. 8° 28', 100 to 200 meters; S. 1° 11' E. 5° 38', 300 meters; types of Stomias affinis and Stomias elongatus).

Stomias elongatus WOOD MASON and ALCOCK, Ann. Mag. Nat. Hist., London, ser.6, vol.8, 1891, p.129. N. 8° 23' E. 75° 47', 738 fathoms, Laccadive Sea. - GOODE and BEAN, Oceanic Ichth., 1895, p.108 (reference).- ALCOCK, Journ. Asiatic Soc. Bengal, vol.65, pt.2, 1896, p.333 (reference); Cat. Deep.Sea Fishes Indian Museum, 1899, p.147 (type). - GARMAN, Mem. Mus. Comp. Zool.,

vol.24, 1899, p.275 (diagnosis). - PARR, Bull. Bingham Oceanogr. Collection, vol.2, art.4, Oct.1931, p.8 (note).

Stomias valdiviae BRAUER, Deutsch. Tiefsee Exped. Valdivia, vol.15, Tiefsee-Fische, 1906, p.48, text figs. 11 - 12, pl.3, fig.1. Atlantic Ocean, West coast of Africa, Gulf of Guinea in 600 to 2200 meters; Indian Ocean off Sumatra and Sokotra, 594 to 5064 meters. - WEBER and BEAUFORT, Fishes Indo Austral. Archipelago, vol.2, 1913, p.112 (compiled). - EGE, Rep. Danish Oceanogr. Exped. Medit., No.4, vol. A.4, Feb. 28, 1918, p.23 (N. 15° 30' W. 23° 52', 133 meters).

Depth 9 1/2; head 8 1/5, width 2 3/5. Snout 5 in head from snout tip; eye 4, greater than snout, 1 1/8 in interorbital; maxillary reaches hind preopercle edge, length about equals head from snout tip; barbel very slightly less than head, with terminal bulb ending in 3 filaments, subequal, or longest about equals 1 1/2 eye diameters; interorbital 3, slightly convex. Gill rakers about 10 short denticles on lower branch of first arch; gill filaments 1 3/4 in eye.

Large rounded luminous body little less than pupil below hind portion of eye close above upper maxillary edge; upper lateral series of photophores 43 between pectoral and ventral, 7 between ventral and anal; lower or ventral series 56 before ventral, of which 12 on isthmus or before pectoral origin, 6 between ventral and anal, then 17 to caudal base.

D. 15, fin height 2 in total head length; A. 20, fin height 1 7/8; caudal 2 1/4 (?), small, forked apparently with lower lobe longer; least depth of caudal peduncle 1 1/2 in eye; pectoral 1 1/4 in total head, rays 7; ventral 1, rays 5.

Dusky brown, under surface of body more or less blackish. Iris neutral gray.

Fins whitish.

Atlantic and Indian Oceans.

83830 U.S.N.M. N. 32° 39' W. 77.° 1'. May 6, 1886. Albatross Station 2676. Length 110 mm.

Stomias colubrinus Garman

Stomias colubrinus GARMAN, Mem. Mus. Comp. Zool., vol.24, 1899, p.275, pl.57, fig.1. N. 6° 17' W. 82° 5', 1672 fathoms. - BRAUER, Deutsch. Tiefsee Exped. Valdivia, vol.15, Tiefsee-Fische, 1906, p.47, fig.10 (luminous organs) (N. 1° to 14° to S. 3° to 11° W. 2° to 21° to E. 0° to 10°, 1500 to 3500 meters). - EGE, Rep. Danish Dana Exped. Med., No.4, vol.2, A. 4, 1918, p.24 (N. 13° 44' W. 24° 25'). - BEEBE, Zoologica. N.Y.Zool. Soc., vol.12, No.1, April 30, 1929, p.8 (N. 39° 15' W. 72°, 450 fathoms). - NORMAN, Discovery Rep., vol.2, 1930, p.316 (N. 8° to 60° to S. ° 0° to 15° W. 18° to 51° to E. 5° to 10°, 110 to 1100 meters)..

Depth 10; head 7 3/5. Snout 7 in head from snout tip; eye 5 1/3; little greater than snout; maxillary extends 1 1/2 eye diameters beyond eye, length 1 1/5 in head from snout tip; 5 premaxillary teeth, second largest, lower teeth 10 to 12 with second 3 largest, denticulate backward of 12; large hooked fang each side of vomer; fang on forward end of each palatine; barbel 1 1/10 in head, luminous bulb 3/4 length from chin, extend beyond bulb in couple of filaments or tentacle; interorbital level.

Infraorbital luminous organ about side of pupil, below hind part of eye. Lateral photophores 43 between pectoral and ventral, 9 between ventral and vent; ventral series 49 between isthmus and ventral, of which 10 on isthmus, 11 between [illegible] and 1.

ventral and anal, 14 from anal origin to caudal.

D. 18, fin height 2 2/5 in total head; A. 21, fin height 2 2/3; caudal 2; least depth of caudal peduncle 6; pectoral 1 1/4, rays 6; ventral rays 5, fin 1 in total head.

Intense black, fins lighter. Tongue white. Length 267 mm. (Garman).

Stomias atriventer Garman

Stomias atriventer GARMAN, Mem. Mus. Comp. Zool., vol.24, 1899, p.277, pl.56, fig.4. N. 25° 26' 15" W. 109° 48', 1218 fathoms.

Depth 9 3/4; head 7, width 2 1/4 (?). Snout 5 (?) in head; eye 5, subequal with snout, 1 1/2 in interorbital; maxillary extends about 2 eye diameters behind eye, length very slightly less than head from snout tip; second pair of premaxillary teeth longest; first, second and fourth pairs of mandibular teeth longest; interorbital 3 (?) in head. Gill rakers 10 short, small denticles on lower branch of first arch; gill filaments 1 1/3 in eye.

Rather large photophore below eye center close above upper maxillary edge; upper lateral series 40 (?) to ventral; lower or ventral series 9 on isthmus, 43 between pectoral and ventral, 12 between ventral and anal, 16 between anal origin and caudal.

D. 15 (?), damaged; A. 17 (?), fin height 2 in total head; caudal 1 4/5 (?) forked, lobes slender, pointed; least depth of caudal peduncle subequal with eye; pectoral 2 2/3 (?); ventral 2 (?).

Brown, abdomen dusky to blackish brown, whitish photophores in contrast. Iris grays. Fins all pale.

86887 U.S.N.M. Albatross Station 2791. Length 164 mm. Poorly preserved.

Stomias fusus Beebe

Stomias fusus BEEBE, Zoologica Sci., vol.12, No.1, April 30, 1929, p.7, fig. 1 -b (end of barbel). N. 39° 15' W. 72°, 600 fathoms. 125 miles south of New York City. - PARR, Bull. Bingham Oceanogr. Collection, vol.2, art.4, Oct. 1931, p.8 (diagnosis in key).

Depth 12 1/2; head 11. Snout 3 1/5 in head; eye 5 2/5, 1 1/3 in snout; barbel elongated spindle, 1 1/3 in head, pale golden yellow densely flecked with black chromatophores; terminal bulb unpigmented, purple, separated from spindle by narrow black band; bulb terminates in 2 elongated filaments, rather thick at base and tapering to fine point, wrinkled at basal half and jet black.

Suborbital luminous organ small, oval, purple on lower half, white above. Ventral photophores 11 between isthmus and pectoral, 47 between pectoral and ventral, 12 between ventral and anal, 15 between anal and caudal.

Scales 73 in lateral series.

D. 20; A. 22; ventral rays 5. Length 250 mm. (Beebe.)

Atlantic.

Stomias boa (Risso)

Esox boa RISSO, Ichth. Nice, 1810, p.330, pl.10, fig.34. Nice.

Stomias boa VALENCIENNES, Hist. Nat. Poiss., vol.18, 1846, p.368, pl.545 (Nice). - PETERS, Monatsber. Akad. Wiss. Berlin, 1876 (1877), p.846 (Pacific Ocean in S. Lat. 42° 56' W. Long. 149° 26' 3"), - GÜNTHER, Rep. Voy. Challenger, vol.22, 1887, p.204 (South of Australia, 1800 fathoms). - VAILLANT, Exped.

Sci. Travailleur et Talisman, Poiss., 1888, p.115 (Gulf of Gascony, off Portugal, Morocco, Banc d' Arguin, Cape Verde Islands, 405 to 800 meters).- GOODE and BEAN, Oceanic Ichth., 1895, p.108, pl.34, fig.138 (compiled). - BRAUER, Deutsch. Tiefsee Exped. Valdivia, vol.15, Tiefsee-Fische, 1906, p.49 (compiled). - GARMAN, Mem. Mus. Comp. Zool., vol.24, 1899, p.275 (diagnosis). - ZUGMAYER, Rés. Camp. Sci. Monaco, vol.35, 1911, p.71, pl.4, fig.1 (N. 36 ° to 40 ° W. 0 ° to 28 °, 1200 to 5100 meters). - MURRAY and HJORT, Depths of the Ocean, 1912, p.611, fig.453 (Plymouth to Gibralter, thence to Gran Canaria, thence to Cape Bojador, Azores to Newfoundland, thence to Glasgow, thence to Bergen, 1000 to 5035 meters). - FOLWER, Mem. Bishop Mus., vol.10, 1928, p.33 (compiled). - BEEBE, Zoologica N.Y. Zool. Soc., vol.12, No.1, April 30, 1929, p.6 (N. 39 ° 15 ' W. 72 °, 400 to 700 fathoms). - PARR, Bull. Bingham Oceanogr. Collection, vol.2, art.4, Oct.1931, p.9 (note).

Stomias barbatus CUVIER, Regne Animal, ed.2, vol.2, 1829, pp.283, 284. - BONAPARTE, Iconogr. Fauna Italica, vol.3, Pesci, pt.1, fasc.30, 1841, no pagination, pl., fig.3 (Sicily). - CANESTRINI, Fauna Italia, Pesci, 1874, p.128 (Sicily). - GARMAN, Mem. Mus. Comp. Zool., vol.24, 1899, p.275 (diagnosis).

Stomias rissoii SWAINSON, Nat. Hist. Animals, vol.2, 1839, p.298 (on RISSO).

Stomias ferox REINHARDT, Overs. Kon. Dansk. Vidensk. Selsk. Forhn. Köbenhavn, vol.10, 1842, p.77. Greenland. - GARMAN, Mem. Mus. Comp. Zool., vol.24, 1899, p.275 (diagnosis). - EGE, Rep. Danish Oceanogr. Exped. Medit., No.4, vol.2, A.4, 1918, p.1 (Azores to Faroes). - NORMAN, Discovery Rep., vol.2, 1930, p.315 (N. 41 ° 37 ' 15 " W. 12 ° 30 ' 20 ", 900 meters).

Stomias bonapartei FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1911, p.556, fig.1 Italy. BONAPARTE speciemn.)

Stomias elongatus var. atlanticus PAPPENHEIM, Deutsch. Südpolar Exped., vol.15, pt.2, 1914, p.169. S. 35° 10' E. 2° 33', 3000 meters; N. 0° 12' W. 16° 39', 10 meters.

Stomias atlanticus NORMAN, Discovery Rep., vol.2, 1930, p.316, fig.26 (S. 46° 25" E. 15° 13', 192 meters).

Depth 9 4/5 (to 13); head 7 3/4 to 9 3/4, width 2 1/4 to 2 3/5. Snout 4 to 4 1/2 in head from snout tip; eye 4 3/4 to 4 4/5, 1 to 1 1/4 in snout, 1 1/3 to 1 3/5 in interorbital; maxillary reaches hind ridge of preopercle, length 1 1/8 to 1 1/5 in head from snout tip; barbel 1 1/8 times head with terminal bulb giving off 3 or 4 filaments; interorbital 3 3/5 to 4, slightly convex. Gill rakers 9 minute spinules on lower branch of first arch, some with 2 or 3 auxiliary spinules; gill filaments 2 1/5 in eye.

Large photophore below eye center and close above upper maxillary edge. Upper lateral series 46 between pectoral and ventral; lower or ventral series 9 on isthmus, then 2 to pectoral, 48 between pectoral and ventral, 10 between ventral and anal, 16 between anal origin and caudal.

D. 17 to 19, fin height 3 in total head length; A. 20 to 22, fin height 2 1/4; caudal 2 1/5 to 2 2/5, median longest, rounded behind; least depth of caudal peduncle equals eye; pectoral 1 4/5 to 2 in total head; ventral 1 to 1 1/4.

Largely blackish brown; photophores showing mostly paler. Iris neutral gray. Fins all pale brownish.

Atlantic and Pacific Oceans.

23359 U.S.N.M. Bureau of Fisheries 490. Schooner "Addison", Length 243 mm.

23360 U.S.N.M. N. 44° 12' W. 58° 56'. In 230 fathoms. Captain Samuel Peeples. Length 375 mm.

28780 U.S.N.M. N. 39° 46' W. 69° 47'. Bull. Bur. Fisher. Length 130 mm.

28876 U.S.N.M. N. 39° W. 71° Fish Hawk Station. Length 145 mm.

29067 U.S.N.M. N. 38° W. 73°. Fish Hawk Station. Length 258 mm.

31803 U.S.N.M. N. 39° 37' W. 47° 55'. Fish Hawk Station 1139. September 8, 188 . Length 335 mm.

33561 U.S.N.M. N. 39° W. 68°. Albatross Station 2101. Length 75 mm.

35408 U.S.N.M. N. 39° 29' 50" W. 71° 49' 30". Albatross Station 2180. Length 123 mm.

35409 U.S.N.M. N. 39° 29' 00" W. 71° 46' 00". Albatross Station 2181. Length 108 mm.

35417 U.S.N.M. N. 39° 29' 50" W. 71° 49' 30". Albatross Station 2180. Length 260 mm.

35453 U.S.N.M. N. 39° 54' 30" W. 71° 08' 00". Albatross Station 2188. Length 106 mm.

35456 U.S.N.M. N. 39° 45' 30" W. 70° 17' 00". Albatross Station 2191. Length 300 mm.

35623 U.S.N.M. N. 39° 11' 00" W. 72° 08' 30". Length 340 mm.

28838 U.S.N.M. N. 40° 03' W. 70° 31'. Albatross Station.9531. Length 113 mm.

40055 U.S.N.M. Nice. Zool. Mus. Florence. Length 170 mm.

44583 U.S.N.M. N. 39° 54' W. 67° 05' 30". Albatross Station.

2570. Length 278 mm.

44584 U.S.N.M. N. 39° 43' 00" W. 71° 34' 00". Albatross Station 2581. Length 73 mm.

44585 U.S.N.M. N. 39° 48' W. 70° 36'. Albatross Station 2553. Length 137 mm.

44586 U.S.N.M. N. 39° 48' W. 70° 40'. Albatross Station 2553. Length 137 mm.

44587 U.S.N.M. N. 42° 46' W. 51° 00'. Albatross Station 2427. Length 270 mm.

83831 U.S.N.M. W. 40° 09' 30" W. 67° 09' 00". Albatross Station 2571. Length 334 mm. In poor preservation.

83890 U.S.N.M. Albatross Station 2718. Length 99 mm.

83891 U.S.N.M. Albatross Station 2691. Length 190 mm.

85477 U.S.N.M. N. 40° 29' W. 66° 4'. Albatross Station 2572. Length 315 mm. In poor preservation.

1 example U.S.N.M. Albatross Station 2428. Length 158 mm.

Stomias hexagonatus Garman

Stomias hexagonatus GARMAN, Mem. Mus. Comp. Zool., vol.24, 1899, p.276, pl.56, fig.5. N. 5° to 10° W. 79° to 96°, 134 to 2232 fathoms.

Depth 8; head 6 1/4, width 3 1/2. Snout 4 1/8 in head from snout tip; eye 5, 1 1/5 in snout, 1 1/2 in interorbital; maxillary nearly reaching hind ridge of preopercle, length 1 1/5 in head from snout tip; interorbital 4, convex. Gill rakers as 9 spinules on inner edge of lower branch of first arch; gill filaments equal eye.

Barbel to end of filaments long as head, terminates in bulb giving off 2 or 3 slender filaments about twice long as eye.

Conspicuous photophore below eye posteriorly and close to upper maxillary edge; upper lateral photophores 27 from pectoral to ventral, 10 between ventral and anal; lower or ventral series 46 before ventrals of which 8 (?) on isthmus besides 2 more before pectoral origin; 11 between ventrals and anal and 14 (?) more to caudal base.

D. 19, fin height 3 1/5 in total head length; A. 24, fin height 2 1/5; caudal (damaged) apparently forked, small; least depth of caudal peduncle equals eye; pectoral 2 (?) in total head; ventral 2 (?)

Uniform brown generally, under surfaces more blackish. Iris neutral gray. Fins whitish.

Le Conte's MS. - p. 244

Stomias brevibarbatus Ege

Stomias brevibarbatus EGE, Rep. Danish Oceanogr. Exped. Medit., No.4, A.4, 1918, p.22, fig.11. N. 31° 59' W. 59° 52'; N. 29° 24' W. 48° 8'; N. 21° 47' W. 47° 11'; N. 25° 35' W. 53° 13'. - PARR, Bull. Bingham Oceanogr. Collection, vol.2, art.4, Oct.1931, p.9 (diagnosis in key).

Depth 9 to 10; head 8 to 9. Snout 6 1/8 in head from snout tip; eye 4, greater than head; maxillary extends 2 eye diameters behind eye, length 1 1/6 in head from snout tip; premaxillary teeth 12, second largest; lower teeth 20, subequal; barbel 3 in head; interorbital very low, eye impinging on upper profile.

Postorbital luminous organ little less than eye. Lateral photophores 33 or 34 between gill opening and ventral, 14 or 15 between ventral and anal; ventral series 11 or 12 from isthmus to pectoral, 33 to 35 from pectoral to ventral, 12 or 13 from ventral to anal, 15 or 16 from anal to caudal.

D. 18 or 19, fin height 4 in total head length; A. 19 or 20, fin height 3 2/5; least depth of caudal peduncle 4 1/8; pectoral 1 1/2, rays 7; ventral rays 5, fin 1 1/3 in total head.

Black, fins yellowish. Scales without metallic sheen. Length 100 mm. without caudal. (Ege.)

Stomias gracilis Garman

Stomias gracilis GARMAN, Mem. Mus. Comp. Zool., vol.24, 1899, p.274 (275) (on GUNTHER).- PARR, Bull. Bingham Oceanogr. Collection, vol.2, art.4, Oct.1931, p.9 (diagnosis in key).

Stomias boa (not RISSO) GUNTHER, Rep. Voy. Challenger, vol.22, 1887, p.204 (South

of Australia).

Depth 12 1/2; head 9 1/3. Barbel long as head, ending in 3 filaments.

Scales 88 in lateral line.

Ventral row of photophores 54 between pectoral and ventral, 14 between ventral and anal, 15 between anal and caudal.

D. 18; A. 18; pectoral rays 6; ventral rays 5; paired fins very narrow and elongate. (Günther.)

Antarctic.)

Stomias nebulosus Alcock

Stomias nebulosus ALCOCK, Ann. Mag. Nat. Hist., series 6, vol.4, 1889, p.451. Gulf of Manaar (N. Lat. 6° 29' E. Long. 79° 34'), in 597 fathoms; Illustrations Zool. Investigator, Fishes, pt.1, 1892, pl.7, fig.1. - GOODE and BEAN, Oceanic Ichth., 1895, pp.108, 515 (reference). - ALCOCK, Journ. Asiatic Soc. Bengal, vol.65, pt.2, 1896, p.333 (reference); Cat. Deep Sea Fishes Indian Museum, 1899, p.146 (type). - GARMAN, Mem. Mus. Comp. Zool., vol.24, 1899, p.275 (diagnosis).- BRAUER, Deutsch. Tiefsee-Fische, 1906, p.50, text f fig. (head) (off East Africa in S. Lat. 0° 24' 5" E. Long. 42° 49' 4" in 1019 meters; N. Lat. 0° 25' 7" E. Long. 43° 37' 8" in 1000 meters). - WEBER, Siboga Exped., vol.57, Fische, 1913, p.13 (Flores Sea, Manipa Strait, Timor Sea, in 421 to 1536 meters).- WEBER and BEAUFORT, Fishes Indo Austral. Archipelago, vol.2, 1913, p.112, fig.40 (on WEBER'S materials). - PARR, Bull. Bingham Oceanogr. Collection, vol.2, art.4, Oct.1931, p.10 (diagnosis in key).

Depth 7 1/2 to 10; head 7 to 8 1/2, width 2 3/4 to 2 4/5. Snout 4 1/5 to 4 1/4 in head from snout tip; eye 3 3/4 to 4, greater than snout, little greater

than interorbital in young to subequal with age; maxillary reaches preopercle ridge, length 1 1/10 to 1 1/8 in head from snout tip; interorbital 3 1/5 to 4 1/3, convex. Gill rakers as 6 or 7 small spinules along inner edge of lower branch of first arch; gill filaments subequal with eye.

Barbel 1 2/5 to 2 1/5 in total head length, with rather long terminal bulb giving off 2 filaments each about long as eye.

Rounded luminous organ little smaller than pupil usually present below hind portion of eye and close above upper maxillary edge; upper lateral photophores 34 to 37 between pectoral and ventral, 6 or 7 between ventral and anal; lower or ventral series 48 to 51 before ventral of which 12 or 12 on isthmus or before pectoral origin, 6 or 7 between ventral and anal, then 16 or 17 to caudal base.

D. 16 to 18, fin height 2 in total head; A. 23 or 24, fin height 1 1/2 to 1 3/4 in head; caudal 1 1/3 to 2, small, forked, lobes slenderly pointed; least depth of caudal peduncle 1 1/3 to 1 2/3 in eye; pectoral 1 1/3 to 1 2/5 in total head length; rays 5 or 6; ventral 1 1/8 to 1 1/3 times total head length, rays 5.

Deep or blackish brown, under surface more sooty or blackish. Iris neutral gray. Fins pale or whitish.

Indian Ocean, East Indies, Philippines.

D. 5216. Anima Sola Island, N. 44 ° W., 29. 50 miles (N. 12 ° 52 ' E. 123 ° 23 ' 30 "), between Burias and Luzon. In 215 fathoms. April 22, 1908. Length 60 to 145 mm. 4 examples.

D. 5387. Bagatao Island Light (outer), S. 80 ° E., 27 miles (N. 12 ° 54 ' 40 " E. 123 ° 20 ' 30 "), between Burias and Luzon. In 209 fathoms. March 11, 1909. Length 99 to 144 mm. 8 examples.

3576. D. 5533. Balicasag Island (C.), N. 71° E., 9. 4 miles (N. 9° 27' 15" E. 123° 31' 48"), between Cebu and Siquijor. In 432 fathoms. August 19, 1909. Length 100 mm.

D. 5534. Balicasag Island (C.), N. 72° E., 14. 7 miles (N. 9° 26' E. 123° 26' 37"), between Cebu and Siquijor. In 333 fathoms. August 19, 1909. Length 80 to 121 mm. 4 examples.

D. 5363. Cape Santiago Light, S. 79° W., 4. 5 miles (N. 13° 47' 20" E. 120° 43' 30"), Balayan Bay, Luzon. In 180 fathoms. February 20, 1909. Length 69 to 120 mm. 8 examples.

3645 and 3646. D. 5564. Dammi Island (N.), S. 85° W., 6. 1 miles (N. 5° 50' E. 120° 31'), between Jolo and Tawi Tawi. In 236 fathoms. September 21, 1909. Length 123 to 172 mm.

D. 5567. Dammi Island (N.), N. 81° W., 9 miles (N. 5° 48' E. 120° 33' 45"), north of Tawi Tawi. In 268 fathoms. September 21, 1909. Length 40 to 135 mm. 13 examples.

D. 5177. Escarceo Light, S. 53° E., 5. 80 miles (N. 13° 35' E. 120° 54' 36"), Verde Island Passage. In 260 fathoms. March 24, 1908. Length 100 mm.

10543 and 10544. D. 5327. Hermanos Island (N.), N. 55° E., 6. 80 miles (N. 18° 31' 30" E. 122° 3'), off northern Luzon. In 198 fathoms. November 12, 1908. Length 112 to 198 mm.

D. 5231. Limasaua Island (S.), S. 68° E., 21. 70 miles (N. 10° 1' 15" E. 124° 43' 15"), between Bohol and Leyte. May 7, 1908. Length 55 to 109 mm. 8 examples.

5541. D. 5233. Limasaua Island (S.), S. 70° E. 19. 50 miles (N. 10° 00' 22' E. 124° 45' 06"), between Bohol and Leyte. May 7, 1908.

Length 118 mm.

5790. D. 5289. Matacot Point, S. 42 ° E., 5 miles (N. 13 ° 41 ' 50 " E., 5 miles (N. 13 ° 41 ' 50 " E. 120 ° 58 ' 30 "), China Sea, vicinity southern Luzon. In 172 fathoms. July 22, 1908. Length 61 to 118 mm. 2 examples.

D. 5171. Omapui Island (W.), S. 22 ° W., 12 miles (N. 5 ° 05 ' E. 119 ° 28 '), Sulu Archipelago vicinity Sibutu Island. In 250 fathoms. February 28, 1908. Length 90 to 100 mm. 3 examples.

Genus MACROSTOMIAS Brauer

Macrostomias BRAUER, Zool. Anzeiger, vol.25, 1902, p.283. Type Macrostomias longibarbatus BRAUER, monotypic.

Body greatly elongated, thin, strongly compressed. Head small, compressed. Mouth cleft long, lower jaw strongly protruded. Both jaws with 5 large teeth, gradually shorter posteriorly. Palatines with 1 to 3 pairs of canines. Gill openings broad. Gill rakers very short. Gills 4. Branchiostegals 18. Body covered with thin hexagonal scales. Dorsal and anal far postmedian, near last eighth in trunk. Dorsal rays 13 to 15. Anal rays 17 or 18. Pectoral rays 6. Ventral rays 4, filamentous, postmedian.

One species.

Macrostomias longibarbatus Brauer

Macrostomias longibarbatus BRAUER, Zool. Anzeiger, vol.25, 1902, p.283. Gulf of Guinea, 1800 meters; Deutsch. Tiefsee Exped. Valdivia, vol.15, Tiefsee Fische, 1906, p.52, pl.3, fig.2 (type from N. 3 ° 11 ' 1 " E. 5 ° 34 ' 9 ";

N. 4 ° 36 ' 1 ' E. 48 ° 37 ' 6 ", 1213 meters off north east Africa). - MURRAY and HJORT, Depths of the Ocean, 1912, p.612 (N. 35 ° 32 ' W. 7 ° 7 ', 1215 meters, between Gibraltar and Gran Canaria; N. 31 ° 24 ' W. 34 ° 47 ', between Gran Canaria and Fayal). - NORMAN, Discovery Rep., vol.2, 1930, p. 315 (S. 00 ° 46 ' E. 5 ° 49 ' 15 ", 850 to 950 meters).

Depth 18; head 12 3/5. Snout to eye 5 in head from snout tip; eye 9, 2 in snout; orbit 5; maxillary extends 3 1/2 eye diameters behind eye, length 1 1/5 in head from snout tip; all teeth fixed and curved; large premaxillary with 5 large teeth, first largest; maxillary with small teeth; lower jaw with 5 teeth with first 3 equally long though shorter than premaxillary teeth, fourth smaller than first 3 and fifth smaller than fourth; vomer with pair of teeth; 1 or 2 pairs on palatines; barbel at least half total length, with terminal luminous organ, with 5 short filaments from each side of base posteriorly, each with small terminal bulb and third and fourth filament with small bulb little above bases; interorbital low.

Scales hexagonal, in 6 transverse rows.

Large, elongate, postocular luminous organ; upper lateral photophores 79 between gill opening and ventral, 67 of 68 between ventral and anal; lower row 93 from isthmus to ventral, 65 to 67 between ventral and anal, 21 or 22 between anal origin and caudal; 18 on branchiostegals.

D. 13 to 15, fin height 1 4/5 in total head; A. 17 or 18, fin height 2 2/3; caudal very slightly greater than head, deeply forked; least depth of caudal peduncle 4 2/3 in total head length; pectoral 1 2/3; ventrals about 4 3/5 in total length.

Back and belly dark, scales pearly. Lower jaw gray. Eye bluish. Fins clear

gray. Length 295 mm. (Brauer.)

Atlantic and Indian Oceans.

ELAPTEROSTOMIAS new genus

Type Elapterostomias philippinus new species.

Body elongate, well compressed. Head large. Two pairs of long fangs in premaxillary and 1 pair at front of mandible. Barbel long as head, with simple terminal bulb. Dorsal rays 14. Anal rays 13. Pectoral less than head. Ventral small.

Diagnosis. Related to Chirostomias Regan and Trewavas in the presence of an adipose fin but differing in the presence of its large postorbital luminous organ.

('Ελαιον, oil or fat, πτερον, fin; Stomias.)

Elapterostomias philippinus, new species.

Depth 6; head 4 1/4, width 2 2/3. Snout 5 in head from snout tip; eye 6, 1 1/5 in snout, 1 4/5 in interorbital; maxillary extends 3 3/4 eye diameters behind eye, slender, length 1 1/10 in head from snout tip; premaxillary teeth 5 or 6, second or third pair longest; 8 to 10 rather large well spaced teeth on each maxillary; 11 teeth on each mandibular ramus, second usually longest; 11 or 12 teeth on each palatine; barbel long as head, slender, with small, simple, terminal bulb; interorbital 3 1/4 in head from snout tip, low, slightly convex. Gill rakers 5 + 11, pairs of short close set denticles, equal gill filaments or 1 2/3 in eye.

Ovoid luminous organ close above upper maxillary edge, entirely behind eye, length but slightly less than eye; small photophore at middle of lower eye edge;

lateral series of photophores 22 between pectoral and ventral, 14 between ventral and anal with 2 more over front of anal; lower or ventral series 13 on isthmus to pectoral, 22 between pectoral and ventral, 13 between ventral and anal, then 15 from front of anal to caudal.

D. II, 12, rays broken, fin height at least 2 1/3 (?) in total head length; adipose fin length equals eye; A. II, 11 rays broken, fin height 3 2/3 (?) in total head length; caudal broken, evidently forked, length 2 (?); pectoral 1 7/8; ventral 2 2/5 (?); least depth of caudal peduncle 3 4/5.

Neutral dusky to deep violaceus gray, blackish on under surface. Iris neutral black. Fins with dusky brown tints.

Type No. 92343. U.S.N.M.

D. 5299. China Sea, vicinity southern Luzon (N. 20° 5' E. 116° 5'). In 524 fathoms. August 8, 1908. Length 164 (?) mm., caudal ends broken off.

Genus CHIROSTOMIAS Regan and Trewavas

Chirostomias REGAN and TREWAVAS, Danish Dana Exped., Oceanogr. Rep., No.6, March 10, 1930, p.54. Type Chirostomias pliopterus REGAN and TREWAVAS, monotypic.

Mouth cleft straight. Premaxillaries and lower jaw with fixed curved barbed fangs; maxillary with row (7 to 12) of fangs and few (2 to 6) small oblique teeth at hind end. Pair of teeth on vomer; long series (7 to 9) on each palatine; several pairs on basibranchials; on gill arches teeth mostly paired. Postocular luminous organ minute, generally concealed under skin. Dorsal rays 18 to 20. Anal rays 22 to 26. Dorsal and anal begin in same vertical, anal ending behind dorsal, which followed by small adipose fin. Pectoral rays 6, slender, all branched terminally, 1 or more with luminous swelling. Ventral I, 6, little postmedian.

ANALYSIS OF SPECIES

1 a.	Eye 4 to 5 in head; D. 16	lucidimanus.
2 a.	Eye 5 4/5 in head; D. 18 to 20	pliopterus.

Chirostomias lucidimanus Beebe

Chirostomias lucidimanus BEEBE, Zoologica N.Y.Zool. Soc., vol.13, No.4, March 1932, p.52. Ten miles south of Nonsuch, Bermuda, 500 fathoms.

Depth 6 1/5; head 6. Snout 3 3/4 in head; eye 5 4/5; 2 large front upper canines, then 5 moderate wide spaced teeth outside, in line with second canine 10 even normal jaw teeth; barbel long as head, elongate blue black bulb somewhat compressed, terminal part projects as 2 large tubular divisions each tipped with pair of sharp toothlike structures opening toward one another with uppermost with few very short tubercles at tip and lower tipped with long, beaded, luminous tentacle while from ventral side 5 long tentacles spring from single base; dorsal surface of bulb with number of isolated luminous spots which consolidate into thick luminous white comb, smooth and rounded, with slender terminal filament; luminous tissue dies out on surface of mid bulb of scattered spots and dots.

Lateral photophores 23 between gill opening and ventral, 19 between ventral and anal of which 7 above anal; ventral series 9 between isthmus and pectoral 25 between pectoral and ventral, 19 between ventral and anal with 6 above anal, 10 from anal to caudal.

D. 16; A. 22; pectoral rays 6; ventral rays 7.

Black. Length 225 mm. without caudal. (Beebe.)

Bermuda.

Chirostomias pliopterus Regan and Trewavas

Chirostomias pliopterus REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.54, pl.1, fig.1, text fig.30 (end of barbel). N. 43° 52' W. 2° 27', Bay of Biscay; N. 33° 18' W. 56° 03'; N. 20° 26' W. 61° 03'; N. 37° 40' W. 26°; 150 to 300 meters.

Depth 6 to 7 2/3; head 5 to 6. Snout 3 3/5 in head from snout tip; eye 4 to 5, 1 to 1 1/4 in snout; maxillary extends 1 2/3 eye diameters behind eye, length 1 1/10 in head from snout tip; barbel 2/3 to 3/4 of head, with stout black stem about 5/8 its length, ending in large ovate swelling with 3 terminal papilliform projections, posterior and median with translucent skin and pigmented core, anterior translucent; anterior projection bearing on its anterior edge short stalk with brush of 4 to 6 filaments, beyond a club shaped appendage and at end of posterior edge 2 prominences each with pair of filaments, median projection with fringe of filaments along posterior edge, terminal enlarged and prolonged with bead like swellings; interorbital moderately low.

Lateral photophores 24 between gill opening and ventral, 18 to 20 between ventral and anal; ventral series 8 or 9 between isthmus and pectoral, 26 to 28 between pectoral and ventral, 18 to 20 (5 above anal) between ventral and anal, 10 or 11 between anal and caudal.

D. 18 to 21, fin height 3 in head; A. 22 to 26, fin height 2 4/5; caudal 1 3/4 forked; least depth of caudal peduncle 4 3/5; pectoral far forward, close to one another, sixth ray longest, sometimes over twice head, with club shaped luminous swelling and similar smaller swellings sometimes on first and fifth rays; ventral length 2 in head, origin equidistant between eye and caudal base or little nearer caudal.

Length 115 mm. without caudal. (Regan and Trewavas.)

Atlantic, north of N. 20°.

Genus TRIGONOLAMPA Regan and Trewavas

Trigonolampa REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.55. Type Trigonolampa miriceps REGAN and TREWAVAS, monotypic.

Mouth cleft straight. Premaxillaries and lower jaw with fangs of moderate size, curved, pointed, fixed; maxillary with few erect and series of small oblique teeth; 1 or 2 pairs of teeth on vomer and long palatine series of 13 teeth on each side; 8 pairs of teeth on basibranchials; small teeth on gill arches. Postocular luminous organ close to eye; posterior small rounded luminous patch and above large triangular one extending backwards from eye. Dorsal rays 18. Anal rays 19. Dorsal and anal fins begin in same vertical. Pectoral rays 5, outermost swollen at base. Ventral rays 7, nearly median.

Trigonolampa miriceps REGAN and TREWAVAS

Trigonolampa miriceps REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.55, pl.1, fig.2. N. 48° 42' W. 12° 20', in 1860 meters.

Depth 8; head 5 1/3. Eye 5 in head; barbel 3/4 of head, tapering, ending in small bulb with short terminal filament.

Postocular luminous organ 1/3 of head. Lateral photophores 22 between gill opening and ventral, 26 between ventral and anal. Ventral series 11 between isthmus and pectoral, 22 between pectoral and ventral, 24 between ventral and anal, 11 between anal and caudal.

D. 18; A. 19; pectoral rays 5; ventrals slightly nearer base of caudal than snout end. Length 105 mm. without caudal. (Regan and Trewavas.)

Atlantic, south of Ireland.

Genus ODONTOSTOMIAS Norman

Odontostomias NORMAN, Discovery Rep., Vol.2, 1930, p.309. Type Odontostomias micropogon NORMAN, orthotypic.

Body elongate. Head short. Mouth cleft straight, jaws rather strong. Teeth tapering to sharp ends; first upper tooth rather small, fixed; second long, depressible, followed by 2 or 3 outer small teeth and 1 inner stronger depressible tooth; at mandibular symphysis, strong fixed fang on either side, followed by inner depressible tooth and 3 or 4 outer fixed teeth; maxillary teeth small, more or less erect; 2 groups, each of 1 to 4 teeth on vomer; 2 to 5 teeth on each palatine; single pair of teeth on basibranchials or none; teeth on gill arches in pairs. Postocular luminous organ well developed (♂?) or absent (♀?). Dorsal rays 20 to 23. Anal rays 23 to 26, inserted nearly below dorsal origin. Pectoral rays 7 to 9, without isolated ray. Ventral rays 7, well postmedian.

ANALYSIS OF SPECIES

1
a. Depth 8 1/2 to 12 1/2; barbel 1 1/2 to 4 in head — micropogon.

2
a. Depth 7 3/4; barbel 1 1/3 times fish — masticopogon.

Odontostomias micropogon Norman

Odontostomias micropogon NORMAN, Discovery Rep., vol.2, 1930, p.309, fig.17 (skull), fig.18. S. 15° 55' E. 10° 35', 600 to 700 meters; S. 13° 58' 30" E. 11° 43' 30", 200 meters; S. 5° 54' E. 11° 19', 110 meters; N. 13° 25' W. 18° 22', 900 meters.

Depth 8 1/2 (young) to 12 1/2; head 7 to 8 2/3. Snout 3 3/4 in head from snout tip; eye 4 1/4 to 6, 1 2/3 in snout; maxillary extends 1 2/3 eye diameters in snout; maxillary extends 1 2/3 eye diameters behind eye, length 1 1/2 in head; 5 fixed teeth in lower jaw; pair of teeth on basibranchials; barbel 1/4 to 2/3 length of head, stem black, ending in simple white portion, scarcely broader than stem in adults but forming more or less definite bulb in young; interorbital low.

Lateral photophores 32 to 35 between gill opening and ventral, 12 to 14 between ventral and anal; ventral series 10 or 11 between isthmus and pectoral, 34 to 36 between pectoral and ventral, 13 to 15 between ventral and anal, 12 or 13 between anal and caudal. Postocular luminous organ little less than eye.

D. 20 to 23. fin height 2 1/8 in total head length; A. 23 to 26, fin height 2 2/5; caudal 2 1/3, forked; least depth of caudal peduncle 6; pectoral 4 1/2, rays 7 to 9; ventral 1, rays 7.

Length 290 mm. (Norman.)

North and South Atlantic.

Odontostomias masticopogon Norman

Odontostomias masticopogon NORMAN, Discovery Rep., vol.2, 1930, p.310, fig.19.

N. 13° 25' W. 18° 22', 900 meters.

Depth 9 1/2; head 7 2/5. Snout 4 in head from snout tip; eye 5 3/4, 1 1/3 in snout; maxillary extends eye diameter behind eye, length 1 1/2 in head; 4 fixed teeth in lower jaw; no teeth on basibranchials; barbel 1 1/3 times length of fish, bulb and possibly part of stem broken off apparently; interorbital low.

Lateral photophores 35 from gill opening to ventral, 15 from ventral to anal;

ventral photophores 10 from isthmus to pectoral, 36 from pectoral to ventral, 14 from ventral to anal.

D. 23, fin height 2 1/3 in total head; A. 26 or 27, fin height 2 1/4; caudal 1 3/5, well forked; least depth of caudal peduncle 7; pectoral 2 2/5, rays 9; ventral 1, rays 7.

Length 290 mm. (Norman.)

North Atlantic.

Genus OPOSTOMIAS Günther

Opostomias GÜNTHER, Rep. Voy. Challenger, vol.22, 1887, p.208, Type Opostomias micripnus GÜNTHER, monotypic.

Moderately elongate. Mouth cleft straight, jaws strong. Teeth tapering to sharp edges; in each jaw 4 fixed teeth on each side, first lower and second upper long fangs, lower pair received into pits in the upper jaw, perforating premaxillaries; single inner depressible tooth in each jaw behind anterior fang; maxillary teeth minute, not piercing skin; pair of small teeth on vomer; palatines and basibranchials toothless; teeth on gill arches small.

Dorsal rays 21. Anal rays 23. Pectoral rays 1 + 3, isolated ray produced. Ventral rays 7, fin little premedian.

Opostomias micripnus (Günther)

Echiostoma micripnus GUNTHER, Ann. Mag. Nat. Hist., series 5, vol.2, August 1878, p.180. Off south coast of Australia, in 2150 fathoms. - MACLEAY, Proc. Linn. Soc. New South Wales, vol.6, 1881, p.227 (copied). - GOODE and BEAN, Oceanic Ichth., 1895, p.110, pl.35, fig.132 (copied).

Opostomias micripnus GUNTHER, Rep. Voy. Challenger, vol.22, 1887, p.208, pl.53,

fig.A (type). - PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, December 30, 1927, p.57 (text fig.6 on p.7) (compiled). - REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.56, figs. 31 - 32, (type).

Depth 7 1/2; head 8 1/2. Snout 4 in head from snout tip; eye 7 1/2, 2 in snout; maxillary extends 2 1/2 diameters behind eye, length 1 1/3 in head from snout tip; barbel 4 3/4 in body without caudal, stem black with white spots; elongate bulb with pigmented terminal filament; unpigmented filament basal to bulb, 2 median and 3 pairs on bulb.

Postorbital luminous organ 2/3 of eye. Lateral photophores 27 between gill opening and ventral, 26 between ventral and anal. Ventral series 5 between isthmus and pectoral, 30 between pectoral and ventral, 26 between ventral and anal, 13 between anal and caudal.

D. 21, fin height 1 4/5 in total head length; A. 23, fin height 2 3/4; caudal 1 4/5; least depth of caudal peduncle 7; ventral 1 1/10; pectoral 7 3/5 in body without caudal, rays 1 + 3, produced ray with terminal third white with pigmented thread along 1 edge, slightly swollen and then tapering.

Length 380 mm. without caudal. (Regan and Trewavas.)

South of Australia.

Genus FLAGELLOSTOMIAS Parr

Flagellostomias PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, Dec.30, 1927, p.49. Type Flagellostomias tyrannus PARR, monotypic.

Body elongate. Mouth cleft straight, jaws strong. Few fixed teeth in each jaw with spear-shaped ends, first in lower jaw and second in upper long fangs,

lower fitting in groove on outer side of upper jaw between first and second teeth; single inner depressible tooth next to anterior fang in lower jaw; maxillary with or without erect tooth and with series of small oblique teeth. Pair of teeth on vomer and 1 or 2 on each palatine; pair of small teeth on basibranchials; small teeth on gill arches. Dorsal rays 14 to 17. Anal rays 23 to 26, extend forward well before dorsal. Pectoral rays 1 + 10, isolated ray long. Ventral rays 7, postmedian.

One species.

Flagellostomias boureei Zugmayer

Eustomias boureei ZUGMAYER, Bull. Inst. Oceanog. Monaco, No.253, 1913, p.3.-

PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, Dec.30, 1927, p.76 (compiled).

Flagellostomias boureei REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.57, fig.33 (end of barbels) fig.34 (pectoral ray), pl.2, fig.2 (N. 35° 53' W. 7° 26"; N. 33° 26' W. 16° 59' off Madeira; N. 21° 57' W. 22° 58'; N. 17° 55' W. 24° 35' off Cape Verde Islands; N. 13° 35' W. 30° 11'; N. 12° 59' W. 32° 49'; N. 13° 47' W. 61° 26' west of St. Lucia; N. 37° 40' W. 26°; 200 to 5000 meters). - NORMAN, Discovery Rep., vol.2, 1930, p.310 (S. 32° 45' W. 8° 47', 650 meters; S. 5° 54' E. 11° 19', 150 meters; N. 6° 55' W. 15° 54', 800 meters).

Flagellostomias tyrannus PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, 1927, p.50, figs. 29 and 30. N. 23° 42' W. 76° 43', 7000 feet.

Depth 9 to 12; head 6 1/2 to 8 1/2. Snout 3 3/4 in head from snout tip;

barbel 1/2 (young) to 2/3 of fish, pigmented stem with white spots, oblong or ovate bulb bears much smaller terminal bulb; terminal part of stem and bulb with numerous unpigmented filaments; interorbital low.

Postocular luminous organ small photophore. Lateral photophores 30 to 32 between gill opening and ventral, 13 to 17 between ventral and anal; ventral series 8 to 10 between isthmus and pectoral, 31 to 33 between pectoral and ventral, 14 to 16 between ventral and anal, 15 to 17 between anal and caudal.

D. 14 to 17, fin height 4 4/5 in total head length; A. 23 to 26, fin height 6; caudal 3 1/8; least depth of caudal 7 4/5; pectoral 1 2/5, rays 10 and long filamentous ray 3 1/2 in body without caudal, with long ovate subetrminal bulb; ventral 5, rays 7.

Length 322 mm. without caudal. (Regan and Trewavas.)

Atlantic, Caribbean Sea.

Genus THYSANACTIS Regan and Trewavas

Thysanactis REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep. No.6, March 10, 1930, p.57. Type Thysanactis dentex REGAN and TREWAVAS, monotypic.

Body elongate. Mouth cleft straight, jaws rather strong. Teeth tapering to sharp point; upper first moderate and fixed, second long, depressible, followed by 2 or 3 outer small fixed teeth and 1 inner depressible tooth; small lower fixed tooth in front, followed by strong fixed anterior fang, next an inner depressible tooth and 4 to 6 smaller fixed teeth; maxillary with or without few erect teeth and with series of small oblique teeth; pair of teeth on vomer and 1 on each palatine; 2 or 3 pairs on basibranchials; teeth on gill arches in pairs. Dorsal rays 17 or 18. Anal rays 21 to 25, origin little before dorsal

origin. Pectoral rays 1 - 10 or 11, isolated ray produced. Ventral rays 7, well postmedian.

Thysanactis dentex Regan and Trewavas

Thysanactis dentex REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.58, fig.35 (end of barbel), fig.36 (pectoral ray), pl.2, fig.1. N. 23° 36' W. 51° 17; N. 12° 11' W. 57° 12'; N. 13° 47' W. 61° 26' west of St. Lucia; N. 15° 08' W. 61° 31' off Dominica; N. 17° 41' W. 60° 58' east of Barbuda; 300 to 3000 meters.

Depth 9 to 12; head 7 to 8 1/2. Eye 4 to 5 in head; barbel long as head, pigmented with anterior and posterior series with anterior and posterior series of white spots that become continuous streaks terminally; tip white, tapering, bearing minute rounded terminal body; white part with double series of short filaments, anterior and posterior, near basal end of each series longer filament, directed terminally and extending beyond end of barbel.

Postocular luminous organ small. Lateral photophores 30 to 32 between gill opening and ventral, 14 to 16 between ventral and anal. Ventral series 20 between isthmus and pectoral, 31 or 32 between pectoral and ventral, 14 to 16 between ventral and anal, 11 or 12 between anal and caudal.

D. 17 or 18; A. 21 to 25; pectoral 1 - 10 or 11 rays, isolated ray longer than head, 1/7 to 1/5 length of fish, pigmented, terminally with tassel of 5 or 6 long unpigmented filaments; ventral 7.

Length 139 mm. without caudal. (Regan and Trewavas.)

Western Atlantic, Caribbean Sea.

Genus LEPTOSTOMIAS Gilbert

Leptostomias GILBERT, Bull. U.S.Fish Comm., vol.23, pt.2, 1903 (1905), p.606.

Type Leptostomias macronema GILBERT, monotypic.

Body elongate. Head short. Mouth straight, oblique, jaws rather strong. Teeth taper to sharp point; first upper tooth moderate and fixed, second long, depressible, followed by few small fixed outer teeth and 1 or 2 inner depressible; lower jaw with strong fixed fang each side of symphysis, posteriorly few small outer fixed teeth and 1 longer inner depressible tooth; maxillary with few erect and series of small oblique teeth. Pair of teeth on vomer; 1 on each palatine; 2 pairs on basibranchials; pairs of short teeth on gill arches. Postocular luminous organ very small. Dorsal rays 16 to 21. Anal rays 20 to 28, begin below or slightly before dorsal origin. Pectoral rays 10 or 11, without isolated ray. Ventral rays 7, well postmedian.

ANALYSIS OF SPECIES

1
a. Stem of barbel without filaments near base.

1
b. Ventral photophores between pectoral and ventral fins 41; barbel with series of minute filaments on basal part of bulb, extending on stem, with pairs of minute filaments on terminal part of bulb

haplocaulus.

2
b. Ventral photophores between pectoral and ventral fins 45 or 46; barbel 1/4 to 1/3 length of fish; filaments of bulb probably as in adult of preceding species

gracilis.

3
b. Ventral photophores between pectoral and ventral 47; barbel nearly 2/3 length of fish macropogon.

4
b. Ventral photophores between pectoral and ventral 45 to 47; barbel nearly long as fish; bulb with minute slightly swollen filaments, not forming a regular series longibarba.

5
b. Ventral photophores between pectoral and ventral 48; barbel nearly 3/4 length of fish bermudensis.

2
a. Stem of barbel with 1 or more filaments near base.

1
cc Bulb of barbel without pair of filaments arising from near its base.

1
d. Bulb of barbel without filaments or appendages; pair of filaments near base of stem of barbel.

1
e. Dorsal rays 16; Anal 20 macronema.

2
e. Dorsal rays 20; Anal 25 leptobolus.

d. Bulb of barbel with 1 or 2 minute filaments or tubercles near tip.

1
f. Dorsal rays 21; Anal 28; stem of barbel with basal filament; bulb obliquely truncated, with 1 tubercle analis.

2
f. Dorsal rays 21; Anal 26; stem of barbel with basal filament and 2 pairs of short fine filaments below truncated bulb, with 2 tubercles. problematicus.

2
c. Bulb of barbel with 1 or 2 pairs of well developed filaments arising from near its base; Dorsal rays 19 or 20; Anal 23 to 25.

1
g. Bulb of barbel broadly rounded terminally gladiator.

1
g. Bulb of barbel with narrow papilla like tip ramosus.

Leptostomias haplocaulus Regan and Trewavas

Leptostomias haplocaulus REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.59, fig.37 (end of barbel). Atlantic west of Bermudas, N. 33° 15' W. 68° 20', in 200 meters.

Depth 13 1/2; head 9 1/2. Eye 5 1/2 in head; maxillary with oblique teeth, first 2 or 3 larger and nearly erect; barbel 3/4 of fish, stem black, without filaments or appendages except just basal to bulb; bulb 3/5 of head, slightly curved, narrow at tip; series of 8 minute filaments on terminal part of stem and basal half of convex side of bulb; 4 pairs of minute filaments on terminal half of bulb.

Lateral photophores 41 between gill opening and ventral, 20 between ventral and anal; ventral series 10 between isthmus and pectoral, 41 between pectoral and ventral, 21 between ventral and anal, 11 between anal and caudal.

D. 19; A. 23; pectoral rays 10; ventral rays 7.

Length 100 mm. without caudal. (Regan and Trewavas.)

Atlantic.

Leptostomias gracilis Regan and Trewavas

Leptostomias gracilis REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No. 6, March 10, 1930, p.59, fig.38 (end of barbels). N. 15° 50' W. 26° 32' off Cape Verde Islands, 1000 meters; N. 13° 35' W. 30° 11', 300 meters.

Depth 13; head 8 3/4 to 9 1/2. Eye 6 in head; maxillary with 1 or 2 erect teeth, rest oblique; barbel 1/4 to little over 1/3 fish, stem black without filaments; slender bulb narrower at tip, 2 in head, generally with 1 or series of minute filaments on basal half and sometimes pair terminally.

Lateral photophores 43 to 45 between isthmus and ventral, 22 between ventral and anal; ventral series 10 between isthmus and pectoral, 45 or 46 between pectoral and ventral, 22 between ventral and anal, 12 or 13 between anal and caudal.

D. 19; A. 23 or 24; pectoral rays 10; ventral rays 7.

Length 75 mm. without caudal. (Regan and Trewavas.)

Atlantic.

Leptostomias macropogon Norman

Leptostomias macropogon NORMAN, Discovery Rep., vol.2, 1930, p.311, fig.20.

S. 35° 01' E. 10° 18', 55 meters, South Atlantic.

Depth 13 3/4; head 9 4/5. Snout 3 1/8 in head from snout tip; eye 4 1/2, 1 1/4 in snout; maxillary extends 3/4 an eye diameter behind eye, length 1 1/3 in head from snout tip; maxillary with oblique teeth, first 2 or 3 larger and nearly erect; barbel 1 3/5 in body without caudal, basal part of stem black, terminal part with white spots and patches which become larger nearer bulb and finally unite to cover black part completely; no filaments or appendages except just basal to bulb, which about 3/5 of head, slightly curved, narrow at tip; series of 4 very small filaments on terminal part of stem and basal half of convex side of bulb, 2 pairs of similar filaments on terminal part of bulb and between these another filament, to which attached minute bulb at end of very fine stem; interorbital low.

Very small infraocular luminous organ. Lateral photophores 45 between gill openings and ventrals, 22 between ventral and anal; ventral series 10 between isthmus and pectoral, 47 between pectoral and ventral, 22 between ventral and anal, 11 between anal and caudal.

D. 20, fin height 2 1/5 in total head; A. 25, fin height 3; caudal 1 4/5; least depth of caudal peduncle 5; pectoral 1 1/2, rays 10; ventral 1 1/5 in head, rays 7.

Length 165 mm. (Norman.)

South Atlantic.

Leptostomias longibarba Regan and Trewavas

Leptostomias longibarba REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.60, fig.39 (end of barbel), pl.1, fig.3. N. 8° 19' W. 22° 32', 100 meters; N. 35° 18' W. 6° 51', 250 meters.

Depth 13 to 14 1/2; head 9 to 10 1/2. Eye 5 in head; maxillary with 1 to 3 erect and series of minute oblique teeth; barbel nearly long as fish, reaching beyond anal origin; black stem without filaments; long bulb 3/5 of head; tapering, with minute slightly swollen filaments.

Lateral photophores 44 to 46 between gill opening and ventral, 22 or 23 between ventral and anal; ventral series 10 between isthmus and pectoral, 45 to 47 between pectoral and ventral, 22 or 23 between ventral and anal, 11 or 12 between anal and caudal.

D. 21; A. 24 to 26; pectoral rays 10 or 11; ventral 7.

Length 250 mm. without caudal. (Regan and Trewavas.)

Atlantic.

Leptostomias bermudensis Beebe

Leptostomias bermudensis BEEBE, Zoologica/ N.Y. Zool. Soc., vol.13, No.4, March 1932, p.59, fig.10 (end of barbel). Seven 1/2 miles southeast of Nonsuch, Bermuda, 500 fathoms.

Depth 15 4/5; head 11. Snout 2 1/5 in head; eye 6; maxillary 1 2/3; 5 pairs of upper teeth, second largest and several small teeth, second largest and several small teeth, 4 to 6 denticles on maxillary and lower dentition similar; barbel nearly 3/4 length of body, unbranched except base of bulb, black basally; bulb slender, slightly curved, cucumber shaped, with 3 short thin median filaments as 1 from back of stem and 2 others from basal part of bulb, half way in bulb pair of larger filaments, another still anterior and then pair subterminal.

Lateral photophores 48 between gill opening and ventral, 22 between ventral and anal; ventral series 10 between isthmus and pectoral, 48 between pectoral a and ventral, 21 between ventral and anal, 12 between anal and caudal.

D. 20; A. 25; pectoral rays 12; ventral rays 7.

Length 297 mm. (Beebe.)

Bermuda.

Leptostomias macronema Gilbert

Leptostomias macronema GILBERT, Bull. U.S.Fish Comm., vol.23, pt.2, 1903 (1905), p.607, pl.72, fig.3. Near Niihaw in 319 to 451 fathoms. - FOWLER, Mem. Bishop Mus., vol.10, 1928, p.34 (type). - REGAN and TRUEWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.60 (compiled).

Melanostomias macronema PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, December 30, 1927, p.49 (type).

Depth 13; head 7 1/5, width 2 3/4. Snout 2 1/2 in head from snout tip; eye 5, 1 4/5 in snout, subequal with interorbital; maxillary extends 1/2 eye diameter behind eye, length 1 1/3 in head from snout tip; teeth uneven, 7 or 8 on

each premaxillary and mandibular ramus, longest near front of jaw correspond to pair slightly shorter in mandible; single slender tooth on extreme outer angle of vomer each side and similar tooth near middle of each palatine; pair of teeth on tongue; barbel inserted on mandible before eye, length 1 2/3 in combined head and body to caudal base, expanded subterminally; interorbital 5, little convex. Gill rakers 3 + 9, short, slender denticles, little longer than gill filaments or 2 in eye.

Four small photophores on head; 1 short curved bar on hind edge of orbit, others small round spots as 1 on subopercle, 1 near maxillary tip, 1 near mandibular angle. Series of photophores on branchiostegal membranes, 1 for each interradial space. Lateral row of photophores well below middle of sides, 63 extend from head to opposite front of anal; lower or ventral row 42 before ventral, 16 between ventral and anal, 8 opposite anal and 6 on caudal peduncle.

D. 16, first ray 2 1/8 in total head length; A. 20, fin height 2 1/10; caudal damaged, small, forked; pectoral 2 1/4, rays 7; ventral 1 4/5, rays 8; least depth of caudal peduncle equals eye.

Blackish. Barbel black on basal half, terminally pale. Iris neutral black. Fins whitish.

Pacific Ocean.

52056 U.S.N.M. Near Niihau, Hawaiian Islands. Albatross Collection 4177. Length 74 mm. Type.

Leptostomias leptobolus Regan and Trewavas

Leptostomias leptobolus REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.60, fig.40 - b (ends of barbels). Caribbean Sea off Dominica N. 15° 08' W. 61° 31', 300 meters; east of Barbuda N. 17° 41'

W. 60° 58', 100 to 300 meters.

Depth 13; head 8 1/2 to 9. Eye 6 in head; maxillary with 3 or 4 small erect teeth followed by series of minute oblique teeth; barbel 3/5 to nearly 3/4 of fish, pair of filaments near base, elongate bulb without filaments or appendages.

Lateral series of photophores 42 or 43 between gill opening and ventral, 20 between ventral and anal; ventral series 10 between isthmus and pectoral, 43 between pectoral and ventral, 20 between ventral and anal, 12 or 13 between anal and caudal.

D. 20; A. 25; pectoral rays 10; ventral 7.

Length 95 mm. without caudal. (Regan and Trewavas.)

Atlantic, Caribbean Sea.

Leptostomias analis Regan and Trewavas

Leptostomias analis REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.61, fig.40 - a, (end of barbel). Caribbean Sea north of St. Croix N. 17° 43. 4' W. 64° 54. 3', 600 meters.

Depth 14; head nearly 9. Eye 5 1/2 in head; maxillary with series of small teeth, first 4 erect, rest oblique; barbel nearly as long as fish, stem black, with minute luminous dots but no patches, giving off slender black filament near base; white bulb elongate, obliquely truncated, with minute tubercle near tip.

Lateral photophores 40 between gill opening and ventral, 22 between ventral and anal; ventral series 10 between isthmus and pectoral, 40 between pectoral and ventral, 22 between ventral and anal, 14 between anal and caudal.

D. 21; A. 28; pectoral rays 10; ventral 8.

Length 168 mm. without caudal. (Regan and Trewavas.)

Western Atlantic.

Leptostomias problematicus (Parr)

Melanostomias problematicus PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, Dec.30, 1927, p.46, figs.26 to 28 - a. N. 23° 42' W. 76° 43', 7000 feet.

Leptostomias problematicus REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.61, fig.41 - a (end of barbel) (compiled).

Depth 17; head 9 1/2. Barbel nearly 2/3 fish, filament near base, 2 pairs of small filaments just below bulb; bulb truncated terminally and bears 2 minute tubercles at end.

Ventral photophores 11 between isthmus and pectoral, 42 between pectoral and ventral, 20 between ventral and anal, 13 between anal and caudal.

D. 21; A. 26.

Length 172 mm. without caudal. (Regan and Trewavas.)

Western Atlantic.

Leptostomias gladiator (Zugmayer)

Nematostomias gladiator ZUGMAYER, Bull. Inst. Océanogr. Monaco, No. 193, Jan.20, 1911, p.5. N. 44° 19' W. 11° 19', 4900 meters, Bay of Biscay; Rés. Camp. Sci. Monaco, vol.35, 1911, p.76, pl.3, fig.5 (type).

Melanostomias gladiator PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, Dec.30, 1927, p.48, fig.28 - b (compiled).

Leptostomias gladiator REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.61, fig.41 - b (compiled).

Depth 12 3/4; head 8 1/2. Barbel 1/2 fish, filament near base, pair not far below bulb, 2 pairs of short swollen filaments close below bulb; bulb cigar shaped, end broadly rounded, with pair of long basal filaments and 3 short swollen filaments near tip.

Ventral photophores 11 between isthmus and pectoral, 40 between pectoral and ventral, 21 between ventral and anal, 13 between anal and caudal.

D. 20; A. 24. Length 270 mm. without caudal. (Regan and Trewavas.)

Eastern Atlantic.

Leptostomias ramosus Regan and Trewavas

Leptostomias ramosus REGAN and TREWAVAS, Danish Dana Oceanogr. Rep., No.6, March 10, 1930, p.61, fig.42 (barbels). N. 25° 07' W. 19° 20'; N. 29° 15'; N. 29° 19' W. 57° 43'; N. 31° 06' W. 41° 45'; N. 31° 39' W. 53° 23'; N. 28° 48' W. 20° 45'; N. 26° 15' W. 20° 53'; N. 21° 57' W. 22° 58'; N. 35° 51' W. 66° 43'; N. 37° 40' W. 26° 00'; N. 39° 26' W. 21° 51'; 150 to 1000 meters.

Depth 10 to 13; head 7 1/2 to 8 1/2. Eye 5 to 6 in head; maxillary with series of small oblique teeth, anterior 2 or 3 sometimes erect; barbel 1/3 (young) to nearly 1/2 of fish, black stem with luminous patches; near base 1 or 2 pairs of filaments, usually unpaired one; other filaments on stem, including pair not far below bulb; white bulb generally more than 1/2 head, slender, with narrow papilla like tip, bearing 1 or 2 pairs of stout filaments near base, 1 to 3 short swollen filaments, often pair near tip and another little behind.

Lateral photophores 39 to 42 between gill opening and ventral, 20 to 22 between ventral and anal; ventral series 10 or 11 between isthmus and pectoral,

39 to 43 between pectoral and ventral, 21 or 22 between ventral and anal, 11 or 12 between anal and caudal.

D. 19 or 20; A. 23 to 25; pectoral rays 7; ventral 7.

Length 180 mm. without caudal. (Regan and Trewavas.)

Atlantic.

Genus GRAMMATOSTOMIAS Goode and Bean

Grammatostomias GOODE and BEAN, Oceanic Ichth., 1895, p.110. Type Grammatostomias dentatus GOODE and BEAN, monotypic.

Mouth cleft straight. Teeth acute; first upper moderate and fixed, second long and depressible; posteriorly in each jaw an outer fixed tooth and series of depressible teeth; maxillary with row of small oblique teeth. Row of teeth on each palatine and 3 pairs of basibranchials. Dorsal rays 20. Anal rays 24, begins below dorsal origin. Pectoral rays 5. Ventral rays 7, premedian.

Grammatostomias dentatus Goode and Bean

Grammatostomias dentatus GOODE and BEAN, Oceanic Ichth., 1895, p.110, pl.35, fig.133. N. 38° 19' 20" W. 69° 02' 30", 2069 fathoms. - JORDAN and EVERMANN, Bull. U.S.Nat. Mus., No.47, pt.1, 1896, p.590 (compiled). - PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, Dec.30, 1927, p.92, figs. 10 and 52 (type). - REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.63 (compiled).

Depth 8 1/2; head 6, width 2 1/2. Snout 4 1/2 in head; eye 4 1/2, sub-equal with snout, 1 1/3 in interorbital; maxillary extends 2 2/3 eye diameters behind eye, length 1 1/10 in head from snout tip; first upper tooth 1 3/5 in

eye, second equals 1 1/4 eye diameters, first lower tooth equals 1 4/5 eye diameters; row of 4 teeth on each palatine; 3 pairs of teeth on tongue; long slender barbel; inserted before eye, reaches (broken) more than half way in space between bases of pectoral and ventral; interorbital 3 7/8, convex. Gill rakers 8 small short spines on lower branch of first arch; gill filaments 1 3/4 in eye.

Moderate suborbital luminous body half size of eye, close above maxillary and behind eye; minute conspicuous orbital photophore at lower eye edge medially. Lower lateral photophores from gill opening to ventral 15 or 16, anal to ventral 22 with last 2 above anal fin base, anal to caudal 12; ventral row from isthmus to pectoral 7, pectoral to ventral 16, ventral to anal 21.

D. 20, fin height 2 1/2 in total head length; A. 24, fin height 2 1/4; caudal 3 (?), damaged, small; pectoral 4 (?), rays 5; ventral 2 1/5, rays 7; least depth of caudal peduncle 1 1/2 in eye.

Pale brown generally, evidently largely dusky to blackish when fresh. Iris neutral dusky. Fins pale to whitish.

Atlantic Ocean.

37370 U.S.N.M. N. 38° 19' 20" W. 69° 2' 30". In 2069 fathoms. Albatross Station 2565. Length 153 (?) mm. Type.

Genus LAMPROTOXUS Holt and Byrne

Lamprotoxus Holt and Byrne, Dep. Agric. Ireland Fisher. Br. Sci. Investigations, No.1, 1913, p.7. Type Grammatostomias flagellibarba HOLT and BYRNE, monotypic.

Moderately elongate. Mouth cleft straight. Teeth acute, larger slightly

barbed; upper first tooth moderate, fixed, second long and depressible; lower first tooth long; behind upper 2 teeth few smaller teeth, fixed and depressible alternating, in lower jaw outer fixed tooth and inner series of depressible teeth; maxillary with series of small oblique teeth. Vomer toothless; 2 teeth on each palatine; 2 pairs on basibranchials; pairs of teeth on gill arches. Closed loop of luminous tissue on each side of body between head and pelvic region, with thicker zig-zag part at front end of lower line. Dorsal rays 18 to 21. Anal rays 20 to 23, begin below dorsal origin. Pectoral rays 4 to 11, one or more rays fleshy. Ventral rays 7, little premedian.

ANALYSIS OF SPECIES

1 a. Short backward projection at front end of zig-zag part of closed loop of luminous tissue on each side of body; pectoral rays 2 or 3, thick, fleshy.

1 b. Pectoral rays 10 — flagellibarba.

2 b. Pectoral rays 4 to 6 — paucifilis.

2 a. Short forward projection or hook at anterior end of zig-zag part of closed loop of luminous tissue on each side of body; pectoral rays 10 or 11, with 1 thick fleshy ray — phanobrochus.

3 a. Long luminous line from behind shoulder girdle to dorsal and anal, with short downward anterior hook; second labial line from snout half way along jaw, curved luminous line from eye to middle of upper jaw; pectoral rays 5 — angulifer.

Lamprotoxus flagellibarba (Holt and Byrne)

Grammatostomias flagellibarba HOLT and BYRNE, Ann. Mag. Nat. Hist., ser.8, vol.6, 1910, p.295. N. 51° 20' W. 11° 56', 736 fathoms, off south west Ireland.

Lamprotoxus flagellibarba HOLT and BYRNE, Dep. Agric. Ireland Fisher. Br. Sci. Investigations, No.1, 1913, p.8, pl.1 (type). - PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, Dec. 30, 1927, p.93 (N. 23° 58' W. 77° 26', 7000 feet). - REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.63, figs.43 and 44 a (type).

Depth 6 1/2; head 5 3/4. Snout 6 in head; eye 7 1/2, 1 2/3 in snout; maxillary extends 4 1/2 eye diameters behind eye, length 1 1/10 in head from snout tip; barbel 6 times fish; interorbital rather low.

Postorbital luminous organ narrow, little shorter than eye. Zig-zag part of luminous lateral loop with small backward projection anteriorly and 3 downward angles. Luminous dots aggregated especially below zig-zag part of loop and on opercle. Lateral photophores 17 between gill opening and ventral, 20 between ventral and anal; ventral series 6 between isthmus and pectoral, 16 between pectoral and ventral, 19 between ventral and anal, 10 between anal and caudal.

D. 21, fin height 2 1/10 in total head; A. 23, fin height 2 1/3; pectoral rays 10, second and third thick and fleshy, length 2 1/3 in head; ventral 1 1/6, rays 7, slightly premedian.

Length 168 mm. without caudal. (Regan and Trewavas.)

Atlantic.

Lamprotoxus paucifilis Regan and Trewavas

Lamprotoxus paucifilis REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.64, fig.44 b, (luminous loop). N. 25° 49' W. 51° 55', 200 meters; N. 31° 06' W. 41° 45', 300 meters.

Depth 6 2/3; head 5 2/3. Eye 6 in head; maxillary teeth very small;

barbel half fish (probably broken).

Postorbital luminous organ small. Lateral luminous loop as in Lamprotoxus flagellibarba, zig-zag part thicker, with 4 downward angles. Lateral photophores 18 between gill opening and ventral, 21 or 22 between ventral and anal; ventral series 7 between isthmus and pectoral, 17 between pectoral and ventral, 21 or 20 between ventral and anal, 11 between anal and caudal.

D. 18 or 19; A. 22; pectoral rays 4 to 6, with 2 fleshy rays, ventral rays 7, nearer snout end than caudal base.

Length 49 mm. without caudal. (Regan and Trewavas.)

Atlantic.

Lamprotoxus phanabrochus Regan and Trewavas

Lamprotoxus phanobrochus REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.64, fig.44 c (luminous loop). N. 21° 27' W. 46° 52'; N. 24° 46' W. 46° 06; west of St. Lucia N. 13° 47' W. 61° 26; east of Barbuda N. 17° 41' W. 60° 58'; 150 to 4000 meters.

Depth 7 to 8 1/2; head 5 1/2 to 6. Eye 6 in head; barbel (?).

Postocular luminous organ small. Luminous lateral loop as in Lamprotoxus flagellibarba, zig zag part thicker, with short hook or projection forwards at anterior end. Lateral photophores 16 or 17 between gill opening and ventral, 21 or 22 between ventral and anal; ventral series 7 between isthmus and pectoral, 17 between pectoral and ventral, 20 to 22 between ventral and anal, 10 to 12 between anal and caudal.

D. 18 to 20; A. 20 to 24; pectoral rays 9 to 11, with 1 fleshy ray; ventral rays 7, nearer snout end than caudal base.

Length 43 mm. without caudal. (Regan and Trewavas.)

Atlantic, Caribbean Sea.

Lamprotoxus angulifer Beebe

Lamprotoxus angulifer BEEBE, Zoologica N.Y. Zool. Soc., vol.12, No.4, March 1932, p.56, fig.9. Fifteen miles southeast of Nonsuch, Bermuda, 500 fathoms.

Depth 7 1/2 to 8; head 5 4/5. Snout 5 4/5 in head; eye 9, 2 1/2 in snout; maxillary extends far beyond eye, but slightly less than head; premaxillary with long strong pair of front fangs, then 5 pairs of teeth outside dental ridge with first and fifth twice as long as others, along ridge 10 teeth each side with anterior pair very long; front pair of mandibular teeth longest of teeth, then 2 more pairs of fangs outside dental line in which 15 variable teeth each side; 3 pairs of small palatine teeth; barbel broken.

Postorbital luminous body long as eye. Lateral photophores 16 between gill opening and ventral, 22 between ventral and anal, 12 between anal and caudal; ventral series 7 between isthmus and pectoral, 17 between pectoral and ventral, 19 between ventral and anal.

D. 21, fin height 2 1/3 in total head; A. 19, fin height 2 2/3; caudal 1 2/3; least depth of caudal peduncle 5; pectoral 2, rays 5; ventral rays 7, length 1 2/5 in head.

Black. Length 155 mm. (Beebe.)

Bermuda.

Genus BATHOPHILUS Giglioli

Bathophilus GIGLIOLI, Tip. Roy. Inst. Sordo Muti Genova, 1884, p.261. Type Bathophilus nigerrimus GIGLIOLI, monotypic; Nature, vol.27, 1883, p.399. (no diagnosis or description.)

Dacthlostomias GARMAN, Mem. Mus. Comp. Zool., vol.24, 1899, p.279. Type Dactyl-

ostomias filifer GARMAN, monotypic.

Trichostomias ZUGMAYER, Bull. Inst. Oceanogr. Monaco, No.193, Jan.20, 1911, p. 6. Type Trichostomias vaillanti ZUGMAYER, monotypic.

Gnathostomias PAPPENHEIM, Deutsch. Südpolar Exped., band 15, Zool. vol.7, 1914, p.171. Type Gnathostomias longifilis PAPPENHEIM, monotypic.

Notopodichthys REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.65. Type Bathophilus brevis REGAN and TREWAVAS, monotypic.

Trichochirus REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.65. Type Bathophilus pawneei PARR.

Body deep and compressed (B. brevis) to slender and rounded (B. filifer). Eyes below oval opening in skin, generally partly concealed, very variable, usually appear small. Mouth cleft straight. Teeth all simple, acute, not barbed. Premaxillaries with front pair of dixed teeth followed each side by row of unequal depressed teeth, first rahter long and extending downward over lower jaw; maxillary with series of small oblique teeth; lower jaw each side with rather strong arterior and smaller lateral fixed tooth and an inner series of depressible teeth. Vomer toothless; 1 or 2 (rarely more) teeth on each palatine and 2 pairs on basibranchials; gill arches toothless. Barbel long, slender, tapering. Dorsal and anal subequal, rays 9 to 18. Paired fins long, with slender rays, some or all of which may be free; pectoral rays 1 to 47; ventral 4 to 26, usually inserted just above lateral series of photophores, sometimes higher.

The serial photophores are said to be difficult to count except in faded specimens though the smaller photophores are conspicuous over the whole surface producing a granular aspect. Skin often with a metallic luster though dull

blackish and lustrous specimen are found in the same species.

ANALYSIS OF SPECIES

1
a. Depth 2 1/4 to 6.
1
b. NOTOPODICHTHYS. Ventrals much nearer dorsal than ventral profile; depth 2 1/4 to 2 3/4; pectoral rays 11 to 13; ventral 11 to 14 brevis.
2
b. BATHOPHILUS. Ventral midway between dorsal and ventral profiles.
1
c. Depth 5 to 6; pectoral rays 34 to 47; ventral 18 to 16 nigerrimus.
2
c. Depth 6; pectoral rays 16 to 19; ventral 16 proximus.
2
a. Depth 6 1/2 to 12.
1
d. TRICHOSTOMIAS. Pectoral rays in 2 well separated groups.
1
e. Pectoral rays 3 to 6 + 7 to 11.
1
f. Ventral rays 7 to 10 longipes.
2
f. Ventral rays 21 irregularis.
2
e. Pectoral rays 3 + 4 or 5.
1
g. Ventral rays 16 to 20 schizochirus.
2
g. Ventral rays 9 digitatus.
3
e. Pectoral rays 2 + 1 or 2; ventral 4 to 6.
1
h. Dorsal rays 13 to 15; anal 13 to 16 metallicus.
2
h. Dorsal rays 11; anal 12 vaillanti.
2
d. GNATHOSTOMIAS. Pectoral rays 4 to 8, first 2 or 3 stronger than rest.
1
i. Pectoral rays 6 to 8; ventral 11 to 14 longipinnis.
2
i. Pectoral rays 5; ventral 9 ater.
3
i. Pectoral rays 4; ventral 16 indicus.

3
d. TRICHOCHIRUS. Pectoral of 2 separate rays inserted close together.

1
j. Ventral rays 11 to 13 pawneei.

2
j. Ventral rays 9 or 10 melas.

3
j. Ventral rays 6 to 8 chironema.

4
d. DACTHLOSTOMIAS. Pectoral single ray; ventral rays 4 or 5 filifer.

Bathophilus brevis Regan and Trewavas

Bathophilus brevis REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.66, pl.3, fig.1. N. 13° 35' W. 30° 11'; off French Guiana N. 5° 06' W. 51° 35'; N. 34° 40' W. 33° 16'; N. 30° 53' W. 54° 07'; west of Bermudas N. 33° 15' W. 68° 20'; 400 to 1000 meters.

Depth 2 1/4 to 2 3/4, ovate, compressed; head 2 2/5 to 3. Snout 3 3/4 in head; eye 8 1/3, 2 1/4 in snout; maxillary extends 4 3/4 eye diameters behind eye; length 1 1/8 in head; interorbital moderately high.

Postocular luminous organ, well separated from eye close above maxillary midway in head length, also small luminous patch anteriorly or below. Luminous patch on middle of side between dorsal and anal fin origins. No serial photophores.

D. 10 or 11, seventh ray 1 7/8 in head; A. 9 or 10, sixth ray 2 1/10; caudal 1 1/4, forked; least depth of caudal peduncle 5; pectoral rays 2 + 9 to 11, 2 2/3 in body without caudal; ventral 2 3/5, rays 11 to 14, inserted much nearer dorsal than ventral profile, equidistant between snout tip and dorsal origin. Length 44 mm. to caudal base. (Regan and Trewavas.)

Atlantic Ocean.

r
Bathophilus nigerimus Giglioli

Bathophilus nigerrimus GIGLIOLI, Tip. Roy. Inst. Sordo Muti Genova, 1884, p.261. Messina; Nature, vol.27, 1882, p.199 (Messina; no description). - GÜNTHER, Rep. Voy. Challenger, vol.22, 1887, p.215 (compiled). - GOODE and BEAN, Oceanic Ichth., 1895, p.111, pl.36, fig.136 (compiled). - SANZO, Mem. R. Com. Talass. Ital. Venice, 1915, p. (larva). - BALDUCCI, Ann. Inst. Océanogr. Monaco, vol.7, fasc.3, 1915, p.1, pl.1 ( ). - PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, Dec.30, 1927, p.86 (compiled). - REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.66, pl.3, fig.2 (Messina; N. 37° 28° E. 8° 8'; N. 32° 16' E. 26° 03'; N. 28° 49' W. 54° 10'; N. 35° 50' W. 44° 55'; N. 28° 06'; W. 55° 16'; N. 25° 34' W. 46° 06'; N. 24° 46' W. 46° 06'; N. 21° 57' W. 22° 58'; east of Barbuda N. 17° 41' W. 60° 58'; Gulf of Mexico N. 23° 58' W. 83° 22'; between 21'; Florida Strait N. 24° 30' W. 80°; Florida and Cuba N. 23° 13' W. 82° ; near St. Croix N. 17° 43' W. 64° 56'; west of Bermudas N. 33° 15' W. 68° 20'; N. 37° 44' W. 25° 56'; 25 to 1000 meters).

Depth 5 to 6; head 4 to 4 1/2. Snout 3 1/4 in head; eye 7, 2 in snout; maxillary extends 4 1/4 eye diameters behind eye, length 1 1/8 in head; interorbital moderately high.

Postocular luminous organ long as eye, with small pearl like protuberance below. Lateral photophores 13 between gill opening and ventral, 9 to 12 between ventral and anal; ventral series 4 or 5 between isthmus and pectoral, 12 or 13 between pectoral and ventral, 11 or 12 between ventral and anal, 5 between anal and caudal. Usually white spot behind ventral fin.

D. 13 to 15, fin height 2 in head; A. 13 to 15, fin height 1 3/4; caudal 2,

forked, lower lobe little longer; least depth of caudal peduncle 6; pectoral rays 34 to 47, first 9 to 11 separate, others contiguous or joined by membrane near base and some rays with luminous expansions, length 3 3/4 in body without caudal; ventral 3 1/8, rays 18 to 26, above lateral photophores, origin equidistant between snout tip and caudal base or nearer caudal.

Length 62 mm. without caudal. (Regan and Trewavas.)
Atlantic, Gulf of Mexico, Caribbean Sea, Mediterranean.

Bathophilus proximus Regan and Trewavas

Bathophilus proximus REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.66, pl.3, fig.3. N. 35° 51' W. 66° 43', 1000 meters.

Depth 5 2/3; head 4 4/5. Snout 3 2/5 in head; eye 6 1/2, 1 4/5 in snout; maxillary extends 2 1/2 eye diameters behind eye, length 1 1/10 in head; interorbital moderately low.

Postocular luminous organ large as eye. Lateral series of photophores 10 between gill opening and ventral, 10 between ventral and anal; ventral series 13 between pectoral and ventral, 13 between ventral and anal, 5 between anal and caudal.

D. 16, fin base 1 2/5 in head; A. 16, fin base 1 3/5; caudal 1 2/5, forked, lower lobe little longer; least depth of caudal peduncle 6 1/5; pectoral 1 1/5, rays 16 to 19; ventral 3 2/3 in body without caudal, rays 16, inserted above lateral photophores little nearer shout end than caudal base.

Length 53 mm. without caudal. (Regan and Trewavas.)

Atlantic, west of Bermuda.

Bathophilus longipes Regan and Trewavas

Bathophilus longipes REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6,

March 10, 1930, p.66, pl.4, fig.3. N. 20° 50' W. 66° 30'; N. 25° 34' W. 46° 6'; N. 32° W. 20° 01; N. 32° 55' W. 21° 51'; off Dominica N. 15° 08' W. 61° 31; south of Jamaica N. 16° 6' W. 76° 2'; west of Jamaica N. 18° 22' W. 78° 38'; N. 18° 50° W. 79° 7'; Gulf of Mexico N. 22° 6' W. 84° 58'; between Florida and Cuba N. 23° 13' W. 82° 21'; N. 23° 13' W. 82° 21'; N. 23° 13' W. 82° 21'; Florida Strait N. 24° 30' W. 80°; near St. Croix N. 17° 43' W. 64° 56'; N. 17° 45' W. 64° 55. 5'; N. 17° 43' W. 64° 56'; 300 to 1000 meters.

Depth 6 1/2 to 10; head 4 1/2 to 6. Snout 3 1/3 in head; eye 10, 3 in snout; maxillary extends 4 1/2 eye diameters behind eye, length 1 1/10 in head; interorbital moderately low.

Postocular luminous organ nearly equals 2 eye diameters, with small white spot anteriorly below eye. Lateral photophores 14 to 16 between gill opening and ventral, 9 or 10 between ventral and anal; ventral series 5 between isthmus and pectoral, 17 between pectoral and ventral, 11 between ventral and anal, 5 between anal and caudal.

D. 13 to 16, fin height 2 1/5 in head; A. 13 to 16, fin height 2 1/8; caudal 2, well forked, lower lobe little longer; least depth of caudal peduncle 7; pectoral 1, rays 10 to 16 (3 to 6 + 7 to 11); ventral rays 7 to 10, 3 4/5 in body without caudal, origin equidistant between eye or postocular and caudal base.

Length 105 mm. without caudal. (Regan and Trewavas.)

Atlantic, Gulf of Mexico, Caribbean Sea.

Bathophilus irregularis Norman

Bathophilus irregularis NORMAN, Discovery Rep., vol.2, 1930, p.311, fig.21.

S. 32° 45' W. 8° 47', 650 meters, South Atlantic.

Depth 6 1/3; head 4 1/4. Snout 3 1/2 in head from snout tip; eye 6, 1 3/4 in snout; maxillary extends 3 1/4 eye diameters behind eye, length equals head from snout tip; 3 large canines on premaxillary with second and third passing outside lower jaw; uniformly small teeth along maxillary edge; 2 large front lower teeth, front one passing outside upper jaw; interorbital rather low.

Postocular organ little longer than eye, small white spot below anteriorly. Lateral photophores 10 + 3 between gill opening and ventral, form ascending row with last 3 on back, 11 between ventral and anal forming curved row running from level of ventral fin upwards nearly to back and then down the same level; ventral series 5 before pectoral, 4 very small ones close together immediately behind pectoral, 2 close together little before ventral and 1 or 2 very small ones just behind ventral fin, 4 close together above vent and 5 behind anal.

D. 12, fin height 1 4/5 in total head; A. 16, fin height 1 7/8; caudal 1 7/8, forked, lower lobe little longer; least depth of caudal peduncle 6; pectoral rays 3 + 7, length 1 1/8 in total head length; ventral rays 21, inserted at middle of side little nearer caudal base than snout tip, length 3 1/8 in body without caudal.

Length 40 mm. (Norman.)

South Atlantic.

Bathophilus schizochirus Regan and Trewavas

Bathophilus schizochirus REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep.,

No.6, March 10, 1930, p.67, pl.4, fig.2. N. 25° 50' W. 76° 55', 1000 meters, Bahamas; N. 23° 36' W. 51° 17', 65 meters.

Depth 7 1/2; head 5. Snout 3 1/4 in head; eye 10, 3 in snout; maxillary extends 4 3/4 eye diameters behind eye, length 1 1/8 in head; interorbital moderately low.

Postocular luminous organ equals 1 1/5 eye diameters, well separated from eye. Lateral series of photophores 13 or 14 between gill opening and ventral, 8 or 9 between ventral and anal; ventral series 5 between isthmus and pectoral, 14 between pectoral and ventral, 8 or 9 between ventral and anal; ventral series 5 between isthmus and pectoral, 14 between pectoral and ventral, 11 between ventral and anal, last 3 or 4 close together, 5 between anal and caudal.

D. 14, fin height 2 1/4 in head; A. 15, fin height 2 1/10; caudal 2 2/3, forked, lower lobe longer; least depth of caudal peduncel 6 3/4; pectoral 1 2/5, rays 3 - 4; ventral rays 19 or 20, length 4 1/2 in body without caudal, origin little nearer caudal base than snout end.

Length 72 mm. to caudal base. (Regan and Trewavas.)

Caribbean Sea.

Bathophilus digitatus (Welsh)

Dactylostomias digitatus WELSH, Proc. U.S.Nat. Mus., vol.62, art.3, 1923, p.9, fig.9. Station 10171, 255 miles west from Bermuda, 75 meters.

Bathophilus digitatus PARR, Bull. Bingham Oceanogr, Collection, vol.3, art.2, Dec.30, 1927, p.90 (copied). - REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.67, fig.45 (copied).

Depth 7 7/8; head 3 2/3, width 2 1/5. Snout 2 1/3 in head; eye 5 1/4, 2 1/2

in snout, 1 1/4 in interorbital; maxillary reaches 2 eye diameters behind eye, length 1 1/4 in head from snout tip; first pair of upper teeth placed high and p protrude through skin of snout, second pair longest or 3/4 of eye, 7 smaller pairs of canines followed by 16 small recumbent teeth; first pair of lower teeth small, exserted and divergent, second pair longest and followed by 8 smaller pairs of canines; 4 or 5 teeth on each palatine; tongue with 2 groups of recurved teeth; barbel long, at least reaches anal, simple, filamentous; interorbital 3, moderately low, convex. No gill rakers; gill filaments short.

Large ovate luminous organ below and behind eye and smaller one in front on upper maxillary edge. Two rows of elongated photophores on each side of body ventrally, 15 in upper row from pectoral to ventral.

D. 14, fin height 1 2/5 in head; A. 15, fin height 1 1/2; caudal 1 2/5, forked; least depth of caudal peduncle 1 1/4 in eye; pectoral 1 in head, rays filamentous, in 2 groups with 3 in first and 4 in second; ventral 3 in combined head and body to caudal base, rays hair like.

Head and body metallic bronze, thickly sprinkled with minute white glandular bodies with blackish edges. Fins white, except swollen black bases of posterior pectoral rays.

Western Atlantic.

84291 U.S.N.M. 225 miles west of Bermuda. Grampus (Bache) Station 10171. In 75 meters. February 2, 1914. Length 35 mm. Type of Dactylostomias digitatus.

Bathophilus metallicus (Welsh)

Trichostomias metallicus WELSH, Proc. U.S.Nat. Mus., vol.62, art.3, 1923, p.11, fig.10. Station 10161, 115 miles east from Cape Hatteras; ~~10166, 115 2/0~~

~~miles east from Cape Hatteras;~~ 10166, 240 miles southeast from Cape Hatteras; 10169, 270 miles southeast from Cape Hatteras; 10173, 185 miles west from Bermuda; 10184, 210 miles south-southwest from Bermuda; 50 to 1000 meters.

Batholphils metallicus PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, Dec. 30, 1927, p.87, fig.50 (type). - REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.67, pl.4, fig.1 (off southern Spain, Canaries, Cape Verde Islands, Bermuda, mid Atlantic, Azores, east and south east of Bermuda, off Lesser Antilles, Morocco, Madeira, Bahamas; 10 to 7000 meters).

Bathophilus simplex PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, Dec. 30, 1927, p.87, fig.9. N. 32° 24' W. 64° 29', 5000 feet.

Depth 7 1/4 to 8; head 4 3/4 to 5, width 2 1/8 to 3. Snout 2 3/4 to 3 1/4 in head; eye 10 to 14 3/5, 2 4/5 to 3 in snout, 2 to 3 1/2 in interorbital; maxillary extends 3 to 3 2/3 eye diameters behind eye, length 1 1/8 to 1 1/6 in head; upper longer teeth project when mouth closes, second pair longest, then third pair below middle of eye; 3 anterior pairs of mandibular teeth longest; each palatine with 2 small teeth; tongue with 2 groups of strong retrorse teeth; barbel very long, filamentous, at least reaches beyond end of caudal, inserted on mandibular opposite eye; interorbital 3 1/4 to 3 2/5, convex. No gill rakers; gill filaments long as eye.

Small ovoid luminous organ close to maxillary behind vertical from hind eye edge, contiguous with which oblong organ on upper maxillary edge; row of indistinct glandular organs on sides of snout and cheeks. Two rows of small elongate photophores on sides ventrally, 30 in each from gill opening to anal;

single row of somewhat larger photophores above anal extend to end of caudal peduncle. in head; A. 13 to 16, fin height 1 3/5 to 1 3/4;

D. 13 to 15, fin height 1 2/3 to 1 3/4; caudal 1 1/2 to 2, forked; least depth of caudal peduncle equals eye; pectoral 3 2/5 to 4 1/2 in combined head and body to caudal base; first two rays slender, united basally and filamentous, third ray stouter and bristle like; ventral 2 2/5 to 3 1/8, hair like and separated entirely.

Head and body dark greenish bronze, with bright metallic reflections, thickly strewn with minute white dots bordered with black pigment. Top of head, edge of opercular flap and photophores black. Iris neutral gray. Barbel white, sprinkled with minute black chromatophores. Fins whitish.

Atlantic.

84294 U.S.N.M. 240 miles south east from Cape Hatteras. Grampus (Bache) Station 10169. In meters. Length 40 mm. Type of Trichostomias metallicus.

84295 U.S.N.M. Grampus (Bache) Station 10169 c. In 50 meters. February 1, 1914. Length 32 to 42 mm. 3 examples.

84296 U.S.N.M. 210 miles south-southwest from Bermuda. Grampus (Bache) Station 10184. In 100 meters. February 20, 1914. Length 40 mm.

84297 U.S.N.M. 115 miles east from Cape Hatteras. Grampus (Bache) Station 10161. In 1000 meters. January 28, 1914. Length 41 mm.

84298 U.S.N.M. 185 miles west from Bermuda. Grampus (Bache) Station 10173. February 4, 1914. In 100 meters. Length 39 to 45 mm. 2 examples.

84299 U.S.N.M. 240 miles south east from Cape Hatteras. Grampus (Bache) Station 10166. In 100 meters. January 30, 1914. Length 38 mm.

Bathophilus vaillanti (Zugmayer)

Trichostomias vaillanti ZUGMAYER), Bull. Inst. Oceanogr. Monaco, No.193, Jan. 20, 1911, p.6. N. 37° 37' W. 10° 53', 4900 meters, off Portugal; Rés. Camp. Sci. Monaco, vol.35, 1911, p.78, pl.3, fig.4 (type).

Bathophilus vaillanti PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, Dec. 30, 1927, p.88 (copied).

Bathophilus metallicus (not WELSH) REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.67 (part).

Depth 7 9/10; head 4 7/8. Snout 2 7/8 in head; eye 10, 3 1/2 in snout; maxillary extends 3 eye diameters behind eye, length 1 1/3 in head; interorbital moderately low.

Postocular luminous organ narrow, long as 1 1/4 eye diameters. Apparently 9 photophores in ventral series between pectoral and ventral, then 6 follow behind ventral not quite 1/3 of space to anal.

D. 11, fin height 1 2/3 in head; A. 12, fin height 1 2/3; caudal 1 4/5, lower lobe longer; least depth of caudal peduncle 8; pectoral rays 2 + 1, length 3 1/2 in body without caudal; ventral 3 3/5, rays 5, origin little nearer snout tip than caudal base.

Black. Fins transparent white. Length 72 mm. without caudal. (Zugmayer.)

Eastern Atlantic.

Bathophilus longipinnus (Pappenheim)

Melanostomias longipinnus PAPPENHEIM, Deutsche Südpolar Exped., vol.15, pt.2, 1914, p.170, text fig.1. N. 24° 41' W. 32° 21', 20 meters, south west of Canaries.

Bathophilus longipinnus PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, Dec.30, 1927, p.91 (copied). - REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.68 (N. 22° 31' W. 62° 7'; N. 24° 44' W. 51° 25'; N. 29° 54' W. 35° 28'; N. 29° 24' W. 48° 8'; Florida Strait, N. 24° 30 W. 80;°; near St. Croix N. 17° 45' W. 64° 55. 5'; 65 to 1000 meters). - NORMAN, Discovery Rep., vol.2, 1930, p.312 (S. 32° 45' W. 8° 47', 650 meters).

Gnathostomias longifilis PAPPENHEIM, Deutsche Sudpolar Exped., vol.15, pt.2, 1914, p.172. N. 24° 41' W. 32° 21', 20 meters, south west of Cape Verde Islands.

Bathophilus longifilus PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, Dec. 30, 1927, p.91 (copied).

Depth 6 1/2 to 8 (11); head 4 to 5 (5 1/2). Snout 2 1/5 to 2 2/5 in head; eye 6 to 12; interorbital 2 to 3.

Postocular organ little larger than eye, with small white spot well anterior or under eye. Lateral photophores 13 to 16 between gill opening and ventral, 10 to 12 between ventral and anal.

D. 14 to 16; A. 15 or 16; pectoral rays 6 to 8, first three rays strongest; ventral rays 11 to 14, nearer caudal base than snout end.

Length 110 mm. to caudal base. (Regan and Trewavas.)

Atlantic, Caribbean Sea.

Bathophilus ater (Brauer)

Bathophilus ater BRAUER, Zool. Anzeiger, vol.25, No. 668, 1902, p.286. Near west coast South Africa, in 1000 meters; Deutsch. Tiefsee Exped. Valdivia,

vol.15, Tiefsee-Fische, 1906, p.57, pl.3, fig.3 (S. Lat. 26° 49 ' 2 " E. Long. 5° 54 ' in 1000 meters).

Bathophilus ater PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, Dec.30, 1927, p.90 (compiled). - REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.68, fig.46 (type).

Depth 8; head 5 1/4. Snout 3 in head; eye 10 2/5, 4 in snout; maxillary extends 3 eye diameters behind eye, length 1 1/4 in head; interorbital low.

Postocular luminous organ with luminous spot in front and oblong patch below. Lateral photophores 16 between gill opening and ventral fin; ventral series 18 between pectoral and ventral; 13 to 15 between ventral and anal.

D. 17, fin height 2 1/10 in head; A. 17, fin height 2 1/6; caudal 1 7/8, well forked, lower lobe longer; least depth of caudal peduncle 6; pectoral rays 5, first 2 longer and stronger and little separated, 3 1/3 in body without caudal; ventral length 2 1/3, rays 9, origin little postmedian.

Bronze colored. Pupil greenish. Barbel whitish. Fins pale. Length 83 mm. to caudal base. (Brauer.)

Atlantic off South Africa.

Bathophilus indicus (Brauer)

Dactylostomias ater indicus BRAUER, Zool. Anzeiger, vol.26, No.668, 1902, p.287.

Near Chagos Islands.

Dactylostomias indicus BRAUER, Deutsch. Tiefsee Exped. Valdivia, vol.15, Tiefsee-Fische, 1906, p.58 (S. Lat. 4° 5 ' 8 " E. Long. 73° 24 ' 8 ", in 2260 meters; S. Lat. 6° 19 ' 3 " E. Lat. 73° 18 ' 9 ", in 1900 meters).

Bathophilus indicus PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, December 30, 1927, p.91 (compiled). - REGAN and TREWAVAS, Danish Dana Exped.

Oceanogr. Rep., No.6, March 10, 1930, p.68 (compiled).

Depth 7 1/2; head 4 1/2. Snout 4 1/5 in head; eye 12; premaxillary with 3 large anterior fangs, then 2 groups each with 3 teeth; maxillary with 20 very small teeth; 2 large front lower teeth, then 2 moderately large and 2 subequal and 7 small; vomer toothless; pair of teeth on palatines; 2 pairs on tongue.

Photophores 15 between pectoral and ventral fins.

D. 13; A. 16; pectoral rays 4; ventral rays 16. Length 37. 5 mm. to caudal base. (Brauer.)

Indian Ocean. The type cut into sections by Brauer.

Bathophilus pawneei Parr

Bathophilus pawneei PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, Dec.30, 1927, p.88, fig.51. N. 25 ° 56 ' W. 77 ° 37 '; N. 24 ° W. 77 ° 17 '; N. 24 ° 29 ' W. 77 ° 29 ', 5000 to 8000 feet. - REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.69, fig.47 (east of Virgin Islands, mid Atlantic, east of Barbados, north east of Lesser Antilles, west of St. Lucia, off Dominica, off Saint Croix, Lesser Antilles, south east of Bermuda; 100 to 3000 meters). - NORMAN, Discovery Rep., vol.2, 1930, p.312 (S. 00 ° 36 ' E. 8 ° 28 ', 100 to 200 meters; S. 3 ° 6 ' 30 " W. 3 ° 53 ', 125 meters).

Depth 6 1/2 to 9 1/2; head 5 to 6 2/3. Snout 3 1/2 in head; eye 7 1/3, 2 in snout; maxillary extends 3 1/4 eye diameters behind eye, length 1 1/6 in head; interorbital rather low.

Postocular luminous organ small, with small luminous patch in front or below its front end. Ventral series of photophores 12 between pectoral and ventral,

14 between ventral and anal, 6 between anal and caudal. Usually small luminous spot behind ventral fin, sometimes 1 on shoulder.

D. 14 to 17, fin height 2 in head; A. 15 to 18, fin height 2; caudal 1 4/5, forked, lower lobe longer; least depth of caudal peduncle 7 1/3; pectoral rays 2, length 3 3/4 in body without caudal; ventral 2 3/4, rays 11 to 13, origin little nearer snout end than caudal base.

Length 116 mm. without caudal. (Regan and Trewavas.)

Atlantic, Caribbean Sea.

Bathophilus melas Regan and Trewavas

Bathophilus melas REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.69, pl.5, fig.2. Bahamas N. 25° 50' W. 76° 55', 600 meters.

Depth 7 3/4; head 4 7/8. Snout 3 1/2 in head; eye 9, 2 3/4 in snout; maxillary extends 4 eye diameters behind eye, length 1 1/8 in head; interorbital moderately low.

Postocular luminous organ equals 1 1/2 eye diameters, with oblique white spot in front of and below its anterior end.

D. 14, fin height 1 3/5 in head; A. 14 or 15, fin height 1 3/5; caudal 1 3/5, forked, lower lobe much longer; least depth of caudal peduncle 6 1/5; pectoral rays 2, 3 1/2 in body without caudal; ventral 3 2/5, rays 9 or 10, origin little nearer caudal base than snout tip.

Deep black. Length 20 mm. to caudal base. (Regan and Trewavas.)

Bahamas.

Bathophilus chironema Regan and Trewavas

Bathophilus chironema REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep.,

No.6, March 10, 1930, p.69, pl.5, fig.3. N. 23° 40' W. 43° 26; N. 29° 43' W. 37° 28'; Florida Strait N. 25° 37 W. 79° 33'; N. 28° 2' W. 62° 26'; west of Bermudas N. 33° 15' W. 68° 20'; 150 to 300 meters.

Depth 7 to 9; head 5 to 5 2/3. Snout 3 1/5 in head; eye 9 3/4, 2 4/5 in snout; maxillary extends 5 eye diameters behind eye, length 1 1/8 in head, interorbital rather low.

Postocular luminous organ with round white spot before and below eye. Generally small luminous spot behind ventral fin. Lateral photophores 14 or 15 between gill openings and ventral fin, 12 or 13 between anal and caudal; ventral series 5 between isthmus and pectoral fin, 15 between pectoral and ventral, 12 or 13 between ventral and anal, 5 to 7 between anal and caudal.

D. 14 to 16, fin height 2 1/5 in head; A. 15 or 16, fin height 1 7/8; caudal 1 3/4, forked; least depth of caudal peduncle 8; pectoral rays 2, fin 3 1/2 in body without caudal; ventral 3 1/2, rays 6 to 8.

Length 53 mm. (Regan and Trewavas.)

Atlantic Ocean.

Bathophilus filifer (Garman)

Dactylostomias filifer GARMAN, Mem. Mus. Comp. Zool., vol.24, 1899, p.279, pl. 56, fig.6. N. 2° 34' W. 92° 6'; N. 10° 14' W. 96° 28'; N. 16° 33' W. 99° 52' 30"; 660 to 2232 fathoms.

Bathophilus filifer PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, Dec. 30, 1927, p.86 (compiled). - REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.69, fig.48 (Gulf of Panama N. 7° 30' W. 79°

19 '; N. 6 ° 49 ' W. 80 ° 25 '; N. 6 ° 40 ' W. 80 ° 47 '; N. 6 ° 48 ' W. 80 ° 33 '; N. 7 ° 15 ' W. 78 ° 54 '; 500 to 4500 meters). - PARR, Bull. Bingham Oceanogr. Collection, vol.2, art.4, Oct.1931,p.18 (N. 16 ° 14 ' W. 99 ° 36 ' 30 ", 625 fathoms).

Depth 9 to 12; head 5 to 6 1/2. Snout 4 in head; eye 6 1/2, 1 2/3 in snout; maxillary extends 3 eye diameters behind eye, length 1 1/5 in head; 6 to 8 slender sharp teeth on each premaxillary, first fixed, second largest, others depressible and passing outside lower jaw; first and third lower teeth fixed, on outer aspect of bone, passing outside upper jaw, second tooth largest and fourth to eight depressible; small immovable teeth on maxillary; short series of small teeth on each palatine; pair of strong hooked teeth on forward part of tongue; barbel very slender, twice long as head, with small bulb at end; interorbital moderately low.

Postocular luminous organ with luminous spot below.

D. 13 to 16, fin height 2 7/8 in head; A. 14 to 17, fin height 3 1/8; caudal small; least depth of caudal peduncle 8; pectoral single ray 5 in body without caudal; ventral 1 1/10 in head, rays 4 or 5, nearly median in body and very close to ventral profile of body.

Intense black. Mouth and stomach black. Fins lighter than body. Small white dots scattered over flanks and below. Length 81 mm. without caudal. (Garman, Regan and Trewavas.)

Pacific off Central America and Galapagos.

Genus PACHYSTOMIAS Günther

Pachystomias GÜNTHER, Rep. Voy. Challenger, vol.22, 1887, p.210. Type Echios-

toma microdon GÜNTHER, monotypic.

Eye large. Jaws rather slender, mouth cleft slightly curved. Teeth in jaws uniserial, slender, curved, acute, unequal, none very large; maxillary with small oblique teeth; teeth on palatines and pharyngeals; teeth on gill arches. Fold of skin connecting branches of lower jaw behind symphysis. Below eye large mass of luminous tissue, forming cushion on each side of roof of palate, appearing externally as long white patch with smaller luminous patch above anterior end; postocular luminous organ small, behind posterior end of lower subocular patch. Dorsal rays 21 to 24. Anal rays 25 to 27, origin below dorsal origin, ending little farther back than dorsal. Pectoral rays 5 to 6. Ventral rays 7, little postmedian.

ANALYSIS OF SPECIES

1
a. Teeth short; close set series of 5 teeth on each palatine, last longest. microdon.

2
a. Teeth longer; 2 teeth on each palatine, posterior longer atlanticus.

Pachystomias microdon (Günther)

Echiostoma microdon GÜNTHER, Ann. Mag. Nat. Hist., series 5, vol.2, August 1878, p.180. Off north west coast of Australia, in 2440 fathoms. - MACLEAY, Proc. Linn. Soc. New South Wales, vol.6, 1881, p.227 (copied).

Pachystomias microdon GÜNTHER, Rep. Voy. Challenger, vol.22, 1887, p.210, pl.53, fig. C (type). - GOODE and BEAN, Oceanic Ichth., 1895, p.111 (reference). - PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, December 30, 1927, p.104 (compiled). - REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep.,

No.6, March 10, 1930, p.70 (type).

Depth 5; head 4 2/3. Snout little less than eye; eye 4 in head; close set series of 5 backwardly directed teeth, last longest, on each palatine; similar series on first basibranchial, double series on second barbel slender, tapering, 1/4 length of head; interorbital 6.

Lateral series of photophores 17 (2 + 4 + 4 + 7) between gill opening and ventral with first 2 ascending obliquely from isthmus, 14 (10 + 4) between ventral and anal ending above vent. Ventral series 17 between pectoral and ventral, 15 between ventral and anal with last 5 in close set series above vent, 9 between anal and caudal.

D. 24; A. 27.

Length 215 mm. without caudal. (Regan and Trewavas.)

Australia.

Pachystomias atlanticus Regan and Trewavas

Pachystomias atlanticus REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.70, pl.6, fig.1. N. 13° 47' W. 61° 26', 3500 meters, Caribbean Sea west of St. Lucia.

Depth 5; head 4 1/2. Snout 4 in head from snout tip; eye 4, equals snout; maxillary 1 1/3 eye diameters behind eye, length 1 1/8 in head from snout tip; teeth rather long; 2 teeth on each palatine, posterior longer; 2 pairs of teeth on first basibranchial, 4 pairs on second; barbel 2/3 of total head length, slender, tapering; interorbital 5 in head.

Lateral photophores 18 (2 + 4 + 4 + 8) between gill opening and ventral with first 2 ascending obliquely from isthmus, 13 (9 + 4 between ventral and anal ending above vent. Ventral series 16 (4 + 12) between pectoral and ventral 15

(10 - 5) between ventral and anal ending about vent, 9 between anal and caudal.

D. 21, fin height 2 2/5 in total head length; A. 25, fin height 2 3/4; caudal 3; least depth of caudal peduncle 10; pectoral 3 4/5; ventral 1 1/4.

Length 165 mm. without caudal. (Regan and Trewavas.)

Caribbean Sea, west of St. Lucia.

Genus EUSTOMIAS Vaillant

Eustomias VAILLANT, Exped. Sci. Travailleur et Talisman, Poiss., 1888, p.~~112.~~ p.112. Type Eustomias obscurus VAILLANT, monotypic.

Neostomias GILCHRIST, Marine Invest. South Africa, vol.4, 1908, p.168. Type Neostomias filiferum GILCHRIST, monotypic.

Spilostomias REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.72. Type Eustomias braueri ZUGMAYER, orthotypic.

Urostomias REGAN and TREWAVAS, op. cit., No.6, March 10, 1930, p.72. Type Eustomias macrurus REGAN and TREWAVAS, orthotypic.

Haploconus REGAN and TREWAVAS, op. cit., No.6, March 10, 1930, p.72. Type Eustomias enbarbatus WELSH, orthotypic.

Nominostomias REGAN and TREWAVAS, op. cit., No.6, March 10, 1930, p.72. Type Eustomias bibulbosus PARR, orthotypic.

Rhynchostomias REGAN and TREWAVAS, op. cit., No.6, March 10, 1930, p.72. Type Eustomias parri REGAN and TREWAVAS, orthotypic.

Achirostomias REGAN and TREWAVAS, op. cit., No.6, March 10, 1930, p.72. Type Eustomias lipochirus REGAN and TREWAVAS, orthotypic.

Triclonostomias REGAN and TREWAVAS, op. cit., No.6, March 10, 1930, p.73. Type Eustomias drechseli REGAN and TREWAVAS, orthotypic.

Dinematochirus REGAN and TREWAVAS, op. cit., No.6, March 10, 1930, p.73. Type Neostomias fissibarbis PAPPENHEIM, orthotypic.

Body elongate. Mouth cleft straight. Upper jaw protractile. Teeth in jaws slender, acute, not barbed, unequal, uniserial or irregularly biserial; first 2 upper teeth usually more or less enlarged fangs, fixed or depressible; behind front fangs in each jaw row of teeth, generally divided variable fixed and depressible, forming inner series, often divided into groups with teeth longer posteriorly with smaller outer fixed teeth in gaps between groups; maxillary with row of small oblique teeth; first lower tooth small, fixed, second fixed or depressible fang opposite interspace between first and second upper. Palate toothless; 3 pairs of teeth on basibranchials, none on gill arches. Dorsal rays 20 to 30. Anal rays 32 to 46, extend forward in advance of dorsal. Pectoral rays 0 to 13. Ventral rays 7 or 8, origin median or postmedian.

The largest genus of the family with many species and divided into many subgenera by Regan and Trewavas.

Eustomias radicifilis Borodin

Eustomias radicifilis BORODIN, Proc. New England Zool. Club, vol.11, Jan.10, 1930, p.89. N. 33 ° W. 64 °, 1200 mm.

This species is described without reference to any of the known forms.

ANALYSIS OF SPECIES

1a. Barbel stem unbranched or with simple tapering branch just basal to bulb or pair of filaments at base of bulb.

1b. SPILOSTOMIAS. Upper jaw teeth fixed; lower teeth fixed except fourth and sixth which depressible; pectoral rays 10 to 13; ventrals 8.

1c. Pair of minute filaments or none, immediately basal to bulb of barbel

braueri.

2.

2
c. Pair of long filaments basal to bulb of barbel

stigmatopleura.

2
b. Teeth few, mostly fixed, fourth upper movable or depressible, third and fifth lower and sometimes sixth depressible; pectoral rays 3 to 9; ventral 7.

1
d. UROSTOMIAS. Pectoral rays 9; barbel unbranched

macrurus.

2
d. HAPLOCLONUS. Pectoral rays 3 or 4; barbel with simple tapering branch basal to bulb.

1
e. Bulb without appendage bearing several stalked small oval or club shaped bodies.

1
f. Median terminal filament about as long as bulb

brevifilis.

2
f. Median terminal filament at least twice long as bulb.

1
g. Bulb with 5 terminal appendages enbarbata.

2
g. Bulb with 3 terminal appendages regani.

2
e. Bulb with appendage resembling bunch of grapes, having numerous stalked small oval or club shaped bodies in a stem.

1
h. Median terminal appendage short, swollen at end

acinosus.

2
h. Median terminal appendage 1/10 length of barbel, branched

burbuva.

3
h. Median terminal appendage 1/5 length of barbel, branched

botrypogon.

3
b. Anterior fangs (first tooth above and second below) fixed; second in upper jaw fixed or depressible; posteriorly in both jaws series of de-

pressible teeth and few smaller outer fixed teeth.

1
i. Pectoral rays 2 or 3; ventral 7; barbel unbranched.

1
j. EUSTOMIAS. Second premaxillary fang not longer than first, separated by rather wide gap; pectoral rays 3; lateral photophores partly in pairs. obscuris.

2
j. NOMINOSTOMIAS. Second premaxillary fang generally longer than first, separated by relatively narrow interspace; photophores evenly spaced.

1
k. Pectoral rays 3.

1
l. Barbel with 2 bulbs.

1
m. Barbel with long tapering terminal appendage, generally unbranched except basally.

1
n. Terminal appendage without filamentous branches bibulbosus.

2
n. Terminal appendage with 1 to 3 simple filaments near base bituberatus.

3
n. Terminal appendage with 4 to 8 filaments near base, which beaded or with terminal swellings micraster.

2
m. Barbel with branched terminal appendage.

1
o Terminal appendage at least half of head, with 2 to 4 main branches in terminal half bimargaritatus.

2
o Terminal appendage less than 1/3 of head, richly branched arborifer.

3
m. Barbel with 5 to 8 pigmented filaments at end of terminal bulb.

1
p. Terminal bulb rounded or ovate, with basal pigment spot; filaments on a stalk melanostigma.

2
p. Terminal bulb elongate, without pigment spot; filaments not stalked melanonema.

4
m. Barbel with 1 bulb.

1
q. Bulb with branched terminal appendage patulus.

2
q. Bulb with simple terminal appendage longibarba.

3
q. Bulb without appendage simplex.

2
k. Pectoral rays 2.

1
r. Barbel with bulb divided by terminal notch into 2 unequal lobes, longer tapering.

1
s. One bulb with 2 minute filaments; barbel 2/7 to 1/3 of body without caudal dubuis.

2
s. Only 1 bulb bearing terminal branched appendages; barbel 1/2 of fish without caudal schiffi.

3
s. Small bulb basal to main one, bears branched terminal appendage, with 2 to 4 bulb like bodies on stem; barbel 1/2 to 2/3 body without caudal polyaster.

2
r. Barbel with 2 to 4 separate bulbs, none bilobed.

1
t. Two well separated bulbs, sometimes with 1 or 2 smaller ones between variabilis.

2
t. Three bulbs, median very near terminal, which larger trituberatus.

3
t. Three bulbs, median very near terminal, which smaller

trawavasae.

4
t. Two bulbs, near together, terminal larger

brevibarbatus.

3
r. Barbel with 1 bulb, sometimes divided, but if so 2 parts

contiguous.

1
u. Bulb divided into basal slender and terminally broadly

rounded part xenobolus.

2
u. Barbel pear shaped, with terminal filament

pyrifer.

3
u. Barbel small, oval, with broad blunt terminal appendage

globulifer.

4
u. Barbel elongate, with minute terminal filament; barbel

long as fish macrophthalmus.

5
u. Barbel elongate, with small filament; barbel 1/2 long

as fish leptobolus.

4
b. Teeth depressible, except few small fixed outer ones; barbel unbranched;

ventral rays 7.

1
v. RHYNCHOSTOMIAS. Pectoral rays 4 or 5

parri.

2
v. ACHIROSTOMIAS. No pectoral fins.

1
w. Barbel axis unpigmented except terminal streak;

corner of terminal edge of bulb produced

dactylobolus.

2
w. Barbel axis pigmented nearly to bulb, which has slight

corner lipochirus.

3
w. Barbel axis pigmented to bulb, which contains black

body melanobolus.

2
a. Barbel stem with at least 1 posterior branch, usually with 3, median originating from between 2 lateral; front fangs fixed on depressible, followed by series of depressible teeth and few small fixed teeth.

1
x. TRICHOSTOMIAS. Pectoral rays 6 or 7; ventral 8; front fangs depressible; babbel with 3 branches.

1
y. Branches long, slender, divided terminally

drechseli.

2
y. Median branch divided terminally; lateral branches simple filaments furcifer.

3
y. Median branch undivided, with terminal bulb; lateral branches simple filaments

tenisoni.

2
x. DINEMATOCHIRUS. Pectoral rays 2, well developed; ventral 7; front fangs fixed either above or below, usually in both jaws.

1
z. Barbel with 3 branches.

1
aa. Lateral branches undivided.

1
bb. Bulb small; lateral branches long parvibulbus.

2
bb. Bulb large, with terminal filaments; lateral branches moderate

bigelowi.

3
bb. Bulb large, without filaments triramis.

2
aa. Lateral branches bifid or at least each with well developed secondary branch.

1
cc. Stem terminal to origin of branches translucent, with pigmented axis.

1
dd. Branches moderate paucifilis.

2
dd. Branches long, median more than twice long as main stem of barbel silvescens.

2
cc. Stem pigmented throughout.

cc1
ee. Median branch rather large bulb on short stem schmidti.

2
ee. Median branch slender, well developed macronema.

3
ee. Median branch fine filament frondosus.

2
z. Barbel with 1 branch.

1
ff. Branch dividing into 4 binghami.

2
ff. Branch ending in bulb bearing 2 long bifid branches fissibarbis.

3
ff. Branch without bulb, bearing several branches dendriticus.

4
ff. Branch slender, simple, ends in small bulb monoclonus.

3
x. NEOSTOMIAS. Pectoral single well developed ray and sometimes minute second ray; ventral rays 7; front fangs depressible; barbel with 3 branches.

1
gg. Branches similar, long, slender, 4 or 5 luminous swellings on stem beyond branches tetranema.

2
gg. Median branches rather short, dissimilar in structure to lateral branches; 2 luminous swellings on stem beyond branches.

1
hh. Lateral branches rather short, divided nearly to base ramulosus.

2
hh. Lateral branches long, undivided, bearing few filamentous

2
hh. Lateral branches long, undivided, bearing few filamentous branches monodactylus.

3
hh. Lateral branches simple, tapering, with minute terminal swellings filifer.

Eustomias acinosus Regan and Trewavas

Eustomias acinosus REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.79, fig.55 (end of barbel). N. 35° 31' W. 55° 58', 150 meters; N. 27° 2' W. 53° 39', 700 meters.

Depth 9 1/2 to 10 1/2; head 7 to 7 2/3. Eye 5 1/2 to 6 1/2 in head; barbel little over 1/4 length of fish, with small rounded bulb bearing towards terminal end appendage resembling bunch of grapes, numerous stalked ovate bodies attached to stem; median terminal appendage of bulb short, swollen at end and slender filament near; barbel without pigment except spot at base of bulb; interorbital 5 1/2 in head.

Lateral photophores 26 or 27 between gill opening and ventral, 11 to 13 between ventral and anal; ventral series 7 between isthmus and pectoral, 26 or 27 between pectoral and ventral, 12 between ventral and anal, 19 to 23 between anal and caudal.

D. 21 or 22; A. 35 or 36; pectoral rays 3; ventral inserted behind middle of length, nearly or quite reaching vent.

Length 114 mm. to caudal base. (Regan and Trewavas.)

Atlantic.

Eustomias arborifer (Parr)

Eustomias bibulbosus subspecies arborifer PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, Dec. 30, 1927, pp.70, 72. N. 24 ° W. 77 ° 17 ', 6000 feet.

Eustomias arborifer REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.85 (compiled).

Depth 15; head 7 1/2. Eye 4 in head; 12 or 13 teeth in each premaxillary; barbel white, 3/4 long as fish, with 2 bulbs, terminal larger and interspace equals length of terminal bulb, terminal appendage less than 1/3 head, richly branched, main filament and branches beaded.

Lateral photophores 33 between gill opening and ventral, 18 between ventral and anal, last 8 behind anal origin; ventral series with 8 between isthmus and pectoral, 33 between pectoral and ventral, 17 between ventral and anal, 19 between anal and caudal.

A. 25; A. 38; pectoral rays 3, fin about 6 1/8 in body without caudal; ventral 6 3/5, rays 7.

Length 105 mm. without caudal. (Parr, Regan and Trewavas.)

Western Atlantic.

Eustomias barbuva Regan and Trewavas

Eustomias barbuva REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.79, pl.7, fig.3, text fig. 55 b. N. 33 ° 18 W. 56 ° 3 ', 150 meters.

Depth 10 3/4; head 7 1/5. Snout 3 1/4 in head; eye 5 1/8, 1 4/5 in snout; maxillary extends 2 1/4 eye diameters behind eye, length 1 1/10 in head; barbel unpigmented, 3 1/3 in body without caudal, bulb ovate with bunch of grape like

bodies, terminal appendage branched, with several swellings and 4 times bulb; interorbital 5 in head.

Postocular luminous organ 3/4 of eye. Lateral photophores 27 between gill opening and ventral, 13 between ventral and anal; ventral series 7 between isthmus and pectoral, 27 between pectoral and ventral, 12 between ventral and anal, 19 between anal and caudal.

D. 24, fin height 4 1/2 in head; A. 36, fin height 3 2/3; caudal 2 1/6; least depth of caudal peduncle 7; pectoral 1 2/5, rays 3 right and 4 left; ventral 6 3/4 in body without caudal.

Length 109 mm. without caudal. (Regan and Trewavas.)

Atlantic.

Eustomias bibulbosus Parr

Eustomias bibulbosus PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, Dec.30, 1927, p.70 (on subspecies bibulbosus). - REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.82, fig.61 (end of barbel) N. 27 ° 02 ' W. 53 ° 39 ', 1100 meters; N. 35 ° 42 ' W. 73 ° 43 ', 300 meters).

Eustomias bibulbosis subspecies bibulbosus PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, Dec.30, 1927, pp.70, 71 (N. 23 ° 58 ' W. 77 ° 26 ', 7000 feet).

Depth 12 to 13; head 8. Eye nearly 5 in head; barbel long as fish, axis lightly pigmented, 2 subequal bulbs or terminal larger seoarated by space 2 or 3 times diameter of larger and tapering terminal appendage about twice as long as head, without branches; interorbital 7 to 8 in head.

Lateral photophores 30 to 33 between gill openings and ventral, 18 or 19 between ventral and anal; ventral series 7 between isthmus and pectoral, 30 to 32 between pectoral and ventral, 18 between ventral and anal, 17 or 18 between anal and caudal.

D. 24 or 25; A. 38; pectoral rays 3.

Length 136 mm. without caudal. (Regan and Trewavas.)

Atlantic.

Eustomias bigelowi Welsh

Eustomias bigelowi WELSH, Proc. U.S.Nat. Mus., vol.62, art.3, 1923, p.6, figs. 5 - 6. 170 miles southeast from Cape Hatteras, 500 meters; 120 miles southeast from Cape Hatteras, 150 meters. - REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.98, fig.85 (barbel) (Florida Strait N. 24° 30' W. 80°, 600 meters; N. 28° 15' W. 56°, 2000 meters).

Eustomias bigelowi subspecies bigelowi PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2. Dec.30, 1927, p.78 (type).

Depth 8 2/3; head 7, width 3. Snout 3 in head; eye 4, 1 1/8 in snout, greater than interorbital; maxillary extends 1 3/4 eye diameters behind eye edge, length 1 1/8 in head; largest upper teeth first, fourth, tenth and thirteenth; palate toothless; tongue with 3 pairs of strong recurved fangs; barbel short, stout, 5 in combined head and body to caudal base, 3 filaments formed midway in its length, subconic bulb at tip giving 3 long and 4 short filaments; interorbital 4 1/5 in head, rather high, convex. Gill rakers not developed or as rudimentary low ridge on each gill arch; gill filaments 1 3/5 in eye.

Small triangular luminous body close above maxillary little below eye. Two rows of small, circular, nearly equidistant photophores along side of body ven-

trally extending to sixth anal ray; thence to caudal peduncle single intermediate row of somewhat larger photophores; upper row from gill opening to ventral 29, ventral to anal 10, along anal 4; lower or ventral row with 9 on isthmus to pectoral, 29 from pectoral to ventral, 10 from ventral to anal, 4 along anal; intermediate row along anal to caudal peduncle 21.

D. 22, fin origin over middle of anal, fin height 2 2/5 in head; A. 41, fin height 3 3/4; caudal 2, forked; pectoral 1 1/2, rays 2, filamentous, closely joined for short space basally; ventral 1 3/5, rays 7, not divided; least depth of caudal peduncle 1 1/5 in eye.

Body and head velvet black, with minute white granulations, most numerous along lower row of photophores. Barbel black, conic tip and filaments white. Dorsal and anal whitish, rays pigmented dusky basally, last 10 banded with black at segments. Pectoral black. Ventral whitish, rays evenly pigmented with black.

Atlantic Ocean.

84284 U.S.N.M. 170 miles south east from Cape Hatteras. In 500 meters. Grampus (Bache) Station 101631/2. January 29, 1914. Length 102 mm. Type.

Eustomias bimargaritatus Regan and Trewavas

Eustomias bimargaritatus REGAN and TREWAVAS, Danish Dana Exped.Oceanogr. Rep., No.6, March 10, 1930, p.84, fig.63 (end of barbel). N. 22° 31' W. 62° 07'; N. 22° 12' W. 40°; N. 22° 14' W. 67° 22'; N. 20° 50' W. 66° 30'; north of Virgin Islands N. 19° 01' W. 65° 23'; N. 28° 2' W. 62° 26'; 100 to 300 meters.

Depth 11 to 15; head 7 to 8. Eye 4 2/3 to 6 in head; barbel from less than 1/2 to nearly 3/4 length of fish, stem unpigmented, terminal of 2 bulbs larger

and separated by space rarely greater than length of larger bulb; terminal appendage from 1/2 to little longer than head, generally dividing at half its length, sometimes further, into 3 filaments, rarely 2 or 4, which generally branched; interorbital 6 1/2 to 7 1/2 in head.

Lateral photophores 33 or 34 between gill opening and ventral, 17 to 19 between ventral and anal; ventral series 7 between isthmus and pectoral, 32 to 34 between pectoral and ventral, 17 or 18 between ventral and anal, 18 to 21 between anal and caudal.

D. 24 to 26; A. 37 to 40.

Length 92 mm. without caudal. (Regan and Trewavas.)

Atlantic.

Eustomias binghami Parr

Eustomias binghami PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, Dec. 30, 1927, p.80, figs. 47 - 48. N. 22° 31' W. 74° 26', 10000 feet, - REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Collection, No.6, March 10, 1930, p.103, fig.93 (end of barbel) (compiled).

Depth 8 7/8; head 6 7/8. Snout 2 3/5 in head; eye 4, 1 3/4 in snout; maxillary extends eye diameter behind eye, length 1 1/6 in head; 15 teeth in each premaxillary and 16 in each limb of lower jaw; barbel 4 1/5 in body without caudal, terminal club shaped bulb 1/3 of barbel, basal 3/4 of hind surface black like stem of barbel, filament long as bulb arises from center of terminal unpigmented area posteriorly also with number of short branches basally, front surface of bulb white with 5 minute filaments terminally; little above middle of barbel brancharies with 3 long filaments each ending in small bulb, each filament giving

off near middle minute rod like luminous body on very short feeble stem; interorbital moderately low.

Postorbital lumihous body nearly large as eye or 5 in head. Lateral photophores 25 between gill opening and ventral, 14 between ventral and anal of which last 4 above anal base; ventral series 7 between isthmus and pectoral, 25 between pectoral and ventral, 14 between ventral and anal, 22 between anal and caudal.

D. 25, fin height 3 2/5 in head; A. 46, fin height 2 3/4; caudal 2 2/5; least depth of caudal peduncle 7; pectoral 1 2/3, rays 2; ventral rays 8, fin 1 1/3 in head.

Length 99 mm. without caudal. (Parr.)

Western Atlantic.

Eustomias bituberatus Regan and Trewavas

Eustomias bituberatus REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No. 6, March 10, 1930, p.83, pl.8, fig.1, text figs. 61 b - e (ends of barbels). N. 27° 31 W. 59° 52'; N. 12° 11' W. 57° 12'; Caribbean Sea near St. Croix N. 17° 43' W. 64° 56'; Caribbean Sea near Martinique N. 14° 38' W. 61° 16'; off French Guiana N. 5° 35' W. 51° 08'; 300 to 700 meters.

Depth 112/3 to 3; head 7 to 9. Snout 2 4/5 in head from snout tip; eye 5 to 6, 2 in snout; maxillary extends 2 1/5 eye diameters behind eye, length 1 1/10 in head; barbel nearly long as to 1 3/4 times fish, axis lightly pigmented with terminal of 2 bulbs larger and separated by distance greater than diameter of either, tapering terminal appendage 7/8 to 1 2/3 times head with 2 filamentous branches (rarely 1 or 3) near base; interorbital 7 or 8 in head, low.

Postocular luminous organ small. Lateral photophores 31 to 34 between gill opening and ventral, 18 or 19 between ventral and anal; ventral series 7 or 8 between ventral and anal; ventral series 7 or 8 between isthmus and pectoral, 32 to 34 between pectoral and ventral, 18 or 19 between ventral and anal, 18 to 21 between anal and caudal.

D. 25 or 26, fin height 4 in total head; A. 36 to 40, fin height 3 1/8; caudal 1 9/10; least depth of caudal peduncle 8; pectoral 2 1/5, rays 3; ventral 6 1/6 in body without caudal, rays 6.

Length 133 mm. without caudal. (Regan and Trewavas.)

Atlantic, Caribbean Sea.

Eustomias botrypogon Regan and Trewavas

Eustomias botrypogon REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.80, fig.56 (end of barbel). Atlantic north of Cape Verde Islands N. 19° 22' W. 24° 6', 500 meters.

Depth 10; head 7 2/3. Eye 5 1/3 in head; barbel more than 1/2 of fish, axis pigmented near small ovate bulb-bearing "bunch of grapes" and other appendages; median terminal appendage long, appears as continuation of stem, terminally with several branches each with basal cigar shaped swelling and terminal filament ending in minute bulb; interorbital 6 1/2 in head.

Lateral photophores 27 between gill opening and ventral, 12 between ventral and anal; ventral series 7 between isthmus and pectoral, 27 between pectoral and ventral, 12 between ventral and anal, 20 between anal and caudal.

D. 23; A. 37; pectoral rays 3. Length 185 mm. without caudal. (Regan and Trewavas.)

Atlantic.

Eustomias braueri Zugmayer

Eustomias braueri ZUGMAYER, Bull. Inst. Océanogr. Monaco, No.193, Jan.20, 1911, p.5, N. 36 ° 14 ' W. 80 °, 1400 meters, off Portugal; Res. Camp. Sci. Monaco, vol.35, 1911, p.72, pl.3, fig.3 (type). - PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2. Dec. 30, 1927, p.76 (copied). - REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.77, fig. 51 c (barbel) (two Monaco sepcimens).

Depth 13; head 6 1/2. Barbel nearly long as head, bulb with leaf like appendage (?), pair of minute filaments at base of bulb.

Ventral photophores 29 between gill opening and ventral, 16 between ventral and anal, 20 between anal and caudal.

D. 22 to 27; A. 36 to 38; pectoral rays 10 to 12; ventral rays 8.

Small white spots above and below lateral photophores. Length 95 mm. without caudal. (Regan and Trewavas.)

Eastern Atlantic.

Eustomias brevibarbatus Parr

Eustomias brevibarbatus PARR, Bull. Bingham Oceanogr. Collection , vol.3, art.3, Dec.30, 1927, p.68, figs. 40 (outline) 36 a (end of barbel). N. 24 ° W. 77 ° 17 ', 6000 feet; N. 23 ° 55 ' W. 77 ° 9 ', 4000 to 7000 feet. - REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.92, fig. 74 b - c (off French Guiana N. 5 ° 35 ' W. 51 ° 08 '; N. 10 ° 24 ' W. 54 ° 38 '; west of St. L,,cia N. 13 ° 47 ' W. 61 ° 26 '; off Dominica N. 15 ° 8 ' W. 61 ° 31 '; off St. Croix N. 17 ° 43. 7 ' W. 64 ° 57 '; N. 17 ° 58. 5 ' W. 64 ° 41 '; N. 17 ° 58. 5 ' W. 64 ° 41 '; N. 17 ° 43 ' W. 64 ° 56 '; be-

tween Florida and Cuba N. 23° 13' W. 82° 21'; south of St. Croix N. 17° 13' W. 64° 58'; N. 17° 43' W. 64° 56'; west of Lesser Antilles N. 16° 3' W. 62° 29'; 50 to 4000 meters).

Depth 10 to 12 1/2; head 7 to 8 2/3. Eye 5 1/3 to 6 2/3 in head; barbel less than 1/4 to 1/3 length of fish, with 2 rounded or oval bulbs, rarely separated by space greater than length of terminal bulb which much larger and bearing small terminal appendage of 2 to 4 filaments on short stalk; axis of stem pigmented between bulbs, basal part of terminal bulb blackish and white filaments with stalks sometimes pigmented; interorbital 6 or 7 in head.

Lateral photophores 32 to 35 between gill opening and ventral, 14 to 18 between ventral add anal; ventral series 7 or 8 between isthmus and pectoral, 32 to 34 between pectoral and ventral, 15 or 16 between ventral and anal, 15 to 18 between anal and caudal.

D. 23 to 26; A. 34 to 38; pectoral rays 2.

Length 148 mm. without caudal. (Regan and Trewavas.)

Western Atlantic, Caribbean Sea.

Eustomias brevifilis Regan and Trewavas

Eustomias brevifilis REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.78, fig.54 (end of barbel). N. 13° 35' W. 30° 11', 300 meters; N. 12° 11' W. 35° 49', 5000 meters.

Depth 10 1/2 to 11 1/2; head 8 to 8 1/3. Eye 5 in head; barbel less than 2/7 to 1/3 of fish, without pigment except spot at base of bulb which small, oval and bearing 4 or 5 terminal filaments, longest branched, long as bulb, branch from stem comparatively short; interorbital 6 1/4 to 6 1/2 in head.

Lateral photophores 27 or 28 between gill opening and ventral, 12 between ventral and anal; ventral series 7 between isthmus and pectoral, 26 or 27 between pectoral and ventral, 11 or 12 between ventral and anal, 19 or 20 between anal and caudal.

D. 22; A. 34 to 36.

Length 105 mm. without caudal. (Regan and Trewavas.)

Atlantic.

Eustomias dactylobolus Regan and Trewavas

Eustomias dactylobolus REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No. 6, March 10, 1930, p.94, pl.8, fig.4, text fig. c (end of barbel). Off Cape Verde Islands N. 15° 50' W. 26° 32', 300 meters; N. 12° 11' W. 35° 49', 300 meters.

Depth 12; head 7 1/2 to 8 1/2. Eye 6 in head; barbel little shorter than head, white stem with series of black dots along front edge and basally anterior blackish streak on axis; rather large bulb truncated, anterior corner of terminal edge produced as blunt appendage; interorbital 5 2/3 in head.

Lateral photophores 29 between gill opening and ventral, 14 between ventral and anal; ventral series 7 between isthmus and pectoral, 28 or 29 between pectoral and ventral, 13 between ventral and anal, 19 or 20 between anal and caudal.

D. 24; A. 38 to 40; no pectoral rays. Length 86 mm. to caudal base. (Regan and Trewavas.)

Atlantic.

Eustomias dendriticus Regan and Trewavas

Eustomias dendriticus REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.

6, March 10, 1930, p.104, fig.96 (end of barbel). N. 29 ° 24 ' W. 48 ° 8 ', 110 meters.

Depth 11 2/3; head 8. Eye 6 in head; barbel nearly long as head, stem pigmented; oblong bulb slightly constricted, pigmented basal to constriction, bearing pair of bifid filaments; only 1 branch unpigmented, tapering branched; first 4 secondary branches come off at same level; interorbital 5 1/3 in head.

Lateral photophores 30 between gill opening and ventral, 16 between ventral and anal; ventral series 7 between isthmus and pectoral, 30 between pectoral and ventral, 15 between ventral and anal, 22 between anal and caudal.

D. 22; A. 38; pectoral rays 2; ventral rays 7.

Length without caudal 64 mm. (Regan and Trewavas.)

Atlantic.

Eustomias drechseli Regan and Trewavas

Eustomias drechseli REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.95, figs.81 (end of barbel) 82 a (dentition). N. 33 ° 42 ' W. 36 ° 16 ', 1000 meters.

Depth 12; head 8. Eye 6 1/2 in head; barbel to end of bulb 1/3 of fish , stem black to just before origin of branches, beyond swollen and white with small translucent terminal appendage ending in small rounded body; branches originate 5/6 barbel length, all 3 similar, long, slender, pigmented except near bases, with short filaments longer ones bearing rounded or oval bodies; stem of each branch ends in rounded or oval body from which 2 or 3 filaments arise, each similarly ending in minute body with 2 to 4 fine terminal filaments; interorbital 6 1/2 in head.

Lateral photophores 29 between gill opening and ventral, 13 between ventral and anal; ventral series 7 between isthmus and pectoral, 29 between pectoral and ventral, 13 between ventral and anal, 22 between anal and caudal.

A. 25; A. 42; pectoral rays 6 or 7, filiform, twice long as head; ventral rays 8.

Length 108 mm. to caudal base. (Regan and Trewavas.)

Atlantic.

Eustomias dubuis Parr

Eustomias dubuis PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, Dec.30, 1927, p.66, figs. 38 (outline) 36 d (end of barbel). N. 23° 58' W. 77° 26', 7000 feet. - REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.88, fig.68 (end of barbel) (Caribbean Sea near St. Croix N. 17° 43' W. 64° 56'; N. 17° 41' W. 60° 58' east of Barbuda; 600 to 1500 meters).

Depth 11 to 15; head 7 1/2 to 8. Snout 2 1/3 in head; eye 4 1/2 to 6, 2 in snout; maxillary extends 1 2/3 eye diameters behind eye, length 1 1/10 in head; 13 teeth on each premaxillary, first and second as fangs; barbel nearly 3 to 3 1/2 in body without caudal, tapering, axis pigmented, bulb divided by deep terminal notch into 2 lobes, shorter rounded and longer tapering, bearing 2 minute terminal filaments; interorbital 7 1/2 to 8 in head.

Postocular luminous organ 5 1/5 in head. Lateral photophores 33 to 35 between gill opening and ventral, 15 to 17 between ventral and anal; ventral series 7 or 8 between isthmus and pectoral, 32 to 35 between pectoral and ventral, 13 to 16 between ventral and anal, 18 to 20 between anal and caudal.

D. 23 or 24, fin height 4 1/5 in head; A. 38 or 39, fin height 3 1/8; caudal 2 2/3; least depth of caudal peduncle 7; pectoral 1 1/3, rays 2; ventral rays 7, fin 7 1/3 in body without caudal.

Length 122 mm. without caudal. (Parr, Regan and Trewavas.)

Western Atlantic, Caribbean Sea.

Eustomias enbarbatus Welsh

Eustomias enbarbatus WELSH, Proc. U.S.Nat. Mus., vol. 62, art. 3, 1923, p.7, figs.7 and 8. Station 10173, 185 miles west from Bermuda, 100 meters; Station 10192, 220 miles northeast from Great Abaco Island, 1000 meters. - PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, Dec.30, 1927, p.76 (compiled). - REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 30, 1930, p.79 (N. 27° 2' W. 53° 39', 150 meters).

Depth 8 to 10 3/5; head 6 to 7, width 2 3/4 to 3. Snout 2 1/2 to 2 3/5 in head from snout tip; eye 5 to 6 (?), 2 to 2 1/4 in snout, 1 1/2 to 1 3/5 in interorbital; maxillary extends 1 to 1 3/4 eye diameters behind eye, length 1 1/8 to 1 1/4 in head from snout tip; teeth unequal canines, upper with first, second and fifth largest, lower with second, fourth and seventh; palate toothless; tongue with 3 pairs of long recurved teeth; barbel long, filamentous, inserted below eye, length 3 1/4 in combined head and body to caudal base, with ovoid terminal bulb, near base long filament given off anteriorly; 5 short filaments extend from terminal end of bulb of barbel of which 4 simple and fifth ends in ovoid body giving off 2 filaments, each in turn bifurcate; interorbital 4 (?) to 4 1/2, rather high, convex. No gill rakers; gill filaments 1 1/3 in eye.

Small luminous body close above maxillary and behind eye. Two rows of small,

circular, nearly equidistant photophores on sides of body ventrally, upper row to end of anal and lower to fifth anal ray, 27 spots in each row from pectoral to ventral.

D. 23, inserted over first third of anal, fin height 2 1/5 to 2 1/3 in head; A. 35, fin height 2 1/3; caudal 2, small, forked; pectoral 1 4/5, rays 3, not united basally with narrow membrane on both sides of each ray; ventral 1, rays 7, two outer short; least depth of caudal peduncle 1 1/4 in eye.

Velvety black, witn minute white granulations, most numerous along lower line of photophores. Barbel white, core punctulate with black, bulb at tip and bodies in filament yellow. Fins whitish, paired ones slightly dusky.

Atlantic Ocean.

84282 U.S.N.M. 185 miles west from Bermuda. Grampus (Bache) Station 10173. In 100 meters. February 4, 1914. Length 69 mm. Type.

84283 U.S.N.M. 220 miles north east of Great Abaco Island. Grampus (Bache) Station 10192. In 1000 meters. February 26, 1914. Length 59 mm. Paratype.

Eustomias filiferum (Gilchrist)

Neostomias filiferum GILCHRIST, Marine Invest. South Africa, vol.4, 1908, p.168, pl.50. Off Cape Point. East north east 36 1/2 miles, in 660 fathoms. - BARNARD, Ann. South African Mus., vol.21, pt.1, June 1925, p.138 (compiled).

Eustomias filiferum PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, December 30, 1927, p. 77 (compiled).

Eustomias filifer REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, Mar March 10, 1930, p.108, figs. 103 - 104 (ends of barbels) (N. 25° 11 ' W. 20° 57 ', 600 meters).

Depth 10 2/5; head 7 7/8. Snout 3 1/8 in head; eye 5 1/3, 2 in snout; maxillary extends 2 1/2 eye diameters behind eye, length 1 1/10 in head; barbel 1 1/3 in body without caudal, black bodies inside at intervals towards end resembling string of beads, basal part with anterior series of black dots, slight luminous swelling little beyond branches; small terminal bulb with several filaments with bead like swellings; branches at first fifth of barbel, median very short, with pair of filamentous branches, ends in bulb with filament and laterals more than 3 times as long, slender, tapering, end in minute bulbs; interorbitals low.

Lateral photophores 28 between gill opening and ventral, 14 between ventral and anal; ventral series 7 between isthmus and pectoral, 27 between pectoral and ventral, 14 between ventral and anal, 23 between anal and caudal.

D. 22 to 25, fin height 3 in head; A. 39 or 40, fin height 2 4/5; caudal 2 1/3; least depth of caudal peduncle 5 1/4; pectoral 1 1/5, 1 ray; ventral rays 7, fin 7 in body without caudal.

Length 230 mm. without caudal. (Gilchrist, Regan and Trewavas.)

Atlantic, South Africa.

Eustomias fissibarbis (Pappenheim)

Neostomias fissibarbis PAPPENHEIM, Deutsche Südpolar Exped., vol.15, pt.2, 1914, p.175, text figs. 4 - 5. N. 24° 41' W. 32° 21', 20 meters, north west of Cape Verde Islands.

Eustomias fissibarbis PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, Dec. 30, 1927, p.81 (compiled). - REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.103, figs. 94 (ends of barbels) 95 a (dentition) (N. 24° 34' W. 28° 4'; N. 23° 40' W. 43° 26'; Caribbean Sea north of St. Croix N. 17° 58. 5' W. 64° 41'; off St. Croix N. 17° 43' W.

64 ° 56 '; Gulf of Mexico north west of Cuba N. 22 ° 06 ' W. 84 ° 58 '; between Florida and Cuba N. 23 ° 35 ' W. 81 ° 54 '; N. 23 ° 13 ' W. 82 ° 21 '; 50 to 1200 meters).

Eustomias nigrifilis PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, Dec.30, 1927, p.81, figs. 8 and 49. N. 24 ° 29 ' W. 77 ° 29 ' 8000 feet.

Depth 10 to 12; head 6 to 8. Eye 5 1/2 to 6 1/2 in head; barbel 1 to 1 1/3 in head, stem and basal half of bulb pigmented, rather elongate bulb with 2 to 4 median and 1 to 3 pairs of filaments terminally; median branch rather stout, ending in small ovate bulb bearing on common stalk several filaments ending in swellings; stem of branch and basal half of its bulb pigmented; lateral branches originating from median branch some distance from main stem of barbel, each divides into 2, limbs pigmented except terminally, may contain oblong or oval swellings and may bear some short filaments; interorbital 5 to 5 1/2 in head.

Lateral photophores 26 to 29 between gill opening and ventral, 14 to 16 between ventral and anal; ventral series 7 between isthmus and pectoral, 27 or 28 between pectoral and ventral, 13 to 15 between ventral and anal, 19 to 21 between anal and caudal.

D. 22 to 26; A. 36 to 41; pectoral rays 2; ventral rays 7.

Length 100 mm. without caudal. (Regan and Trewavas.)

Atlantic, Caribbean Sea.

Eustomias frondosus Regan and Trewavas

Eustomias frondosus REGAN and TREWAVAS, Danish Dana exped. Oceanogr. Rep., No.6, March 10, 1930, p.103, fig.22 (ends of barbels). N. 22 ° 43 ' W. 45 ° 18 '; N. 25 ° W. 64 ° 10 '; Bahamas N. 25 ° 50 ' W. 76 ° 55 '; N. 24 ° 5 ' W.

74° 36'; N. 26° 56' W. 53° 9'; 200 to 800 meters.

Depth 8 to 12; head 6 1/3 to 8 2/3. Eye 5 in head; barbel equals or little longer than head; barbel equals or little longer than head, pigment of stem extends to posterior (sometimes anterior(?)) part of large, ovate or elongate bulb, which bears rather long branched terminal filament terminal to pigmented part; 1 or more smaller median filaments and 1 to 2 pairs of lateral filaments; median branch represented by slender filament, sometimes bearing minute bulb; lateral branches sometimes united at base, each divided into 2 tapering branches bearing several filaments, some with swellings; branches pigmented basally in adult.

Lateral photophores 24 to 26 between gill opening and ventral, 13 to 16 between ventral and anal; ventral series 7 between isthmus and pectoral, 24 or 25 between pectoral and ventral, 14 or 15 between ventral and anal, 20 to 22 between anal and caudal.

D. 23 to 25; A. 39 to 45; pectoral rays 2, sometimes with minute third ray; ventral rays 7.

Length 100 mm. without caudal. (Regan and Trewavas.)

Atlantic.

Eustomias furcifer Regan and Trewavas

Eustomias furcifer REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep.,No.6, March 10, 1930, p.96, 79 b (dentition) (end of barbel). N. 37° 23' W. 26° 2', 3000 meters.

Depth 11 1/2; head 7 2/3. Eye 7 in head; barbel little more than 1/4 fish, pigmented stem to little beyond origin of branches, beyond somewhat swollen and white, except posterior black streak which may be on axis; oval bulb without

appendages, branches originating 4/5 barbel length; lateral branches simple unpigmented filaments; median branch extending beyond end of bulb, unpigmented, forked terminally, each limb of fork bearing several filaments; interorbital 6 1/4 in head.

Lateral photophores 28 between gill opening and ventral, 14 between ventral and anal; ventral series 7 between isthmus and pectoral, 28 between pectoral and ventral, 13 between ventral and anal, 23 between anal and caudal.

D. 24; A. 45; pectoral rays 6; ventral rays 8.

Length 138 mm. without caudal. (Regan and Trewavas.)

Atlantic.

Eustomias globulifer Regan and Trewavas

Eustomias globulifer REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.93, fig 76 a (end of barbel). Caribbean Sea near Martinique N. 14° 38' W. 61° 16', 600 meters.

Depth 14; head 8 3/4. Snout 2 1/3 in head; eye 6; barbel 6 in fish, axis pigmented, densely just below small oval bulb bearing on appendage long as itself, translucent with dark axis; interorbital 6 in head.

Lateral photophores 33 between gill opening and ventral, 16 between ventral and anal; ventral series 7 between isthmus and pectoral, 31 between pectoral and ventral, 16 between ventral and anal, 17 between anal and caudal.

D. 23; A. 33; pectoral rays 2.

Length 70 mm. without caudal. (Regan and Trewavas.)

Caribbean Sea.

Eustomias leptobolus Regan and Trewavas

Eustomias leptobolus REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.94, fig.77 a (end of barbel). Between Florida and Cuba N. 23° 13' W. 82° 21', 800 meters.

Depth 12; head 8 2/3. Eye 4 2/3 in head; barbel 1/2 of fish, stem apparently white, axis with minute black dots; elongate bulb divided by constriction into narrower basal and shorter and broader terminal part; small terminal filament; interorbital 7 1/3 in head.

Lateral photophores 33 between gill opening and ventral, 16 between ventral and anal; ventral series 7 between isthmus and pectoral, 33 between pectoral and ventral, 16 between ventral and anal, 17 between anal and caudal.

D. 23; A. 38; pectoral rays 2.

Length 95 mm. to caudal base. (Regan and Trewavas.)

Straits of Florida.

Eustomias lipochirus Regan and Trewavas

Eustomias lipochirus REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.95, fig. 80 a (end of barbel). Caribbean Sea near St. Croix N. 17° 43' W. 64° 56', 800 meters.

Depth 12; head 8. Eye 5 in head; barbel little less than head, axis pigmented within short space of bulb, anterior series of black dots, rather small bulb ovate, terminally with an anterior corner; interorbital 5 1/2 in head.

Lateral photophores 28 between gill opening and ventral, 13 between ventral and anal; ventral series 35 between isthmus and ventral, 12 between ventral and anal, 20 between anal and caudal.

D. 24; A. 40; no pectoral rays.

Length 88 mm. without caudal. (Regan and Trewavas.)

Caribbean Sea.

Eustomias longibarbus Parr

Eustomias longibarbus PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, Dec.30, 1927, p.64, fig.35 (outline) 36 a (end of barbel). N. 24 ° W. 77 ° 17 ', 6000 feet; N. 23 ° 49 ' W. 76 ° 59 ', 7000 feet.

Eustomias longibarba REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.86, figs. 66-a-b (ends of barbels) 67-c (dentition) (N. 31 ° 59 ' W. 59 ° 52 '; N. 32 ° 55 ' W. 21 ° 51 °; Caribbean Sea west of Jamaica N. 18 ° 50 ' W. 79 ° 7; N. 24 ° 5 ' W. 74 ° 36 '; 110 to 2000 meters).

(?) Eustomias microcephalus PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, Dec.30, 1927, p.75, fig.43. N. 23 ° 49 ' W. 76 ° 59 ', 7000 feet.

Depth 11 to 13; head 7 1/2 to 9. eye 5 in head; barbel from little less than 1/2 to 2/3 length of fish, axis of stem lightly or heavily pigmented, appearing nearly white or blackish; elongate bulb with simple terminal appendage from 1/4 to nearly long as bulb, containing axis bearing minute rounded bodies within translucent sheath; interorbital 6 to 7 in head.

Lateral photophores 32 to 35 between gill opening and ventral, 17 or 18 between ventral and anal; ventral series 7 between isthmus and pectoral, 33 or 34 between pectoral and ventral, 17 to 19 between ventral and anal, 18 to 20 between anal and caudal.

D. 23 to 26; A. 36 to 38; pectoral rays 3.

Length 116 mm. without caudal. (Regan and Trewavas.)

Atlantic, Caribbean Sea.

Eustomias macronema Regan and Trewavas

Eustomias macronema REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.101, fig.91 (end of barbel). N. 30 ° 17 ' W. 20 ° 44 ', 600 meters.

Depth 13 1/2; head 9 1/2. Eye 7 in head; barbel long as head, pigment of stem extending along front edge of large bulb, which concave anteriorly, convex posteriorly, bears long stout terminal filament, lateral branches each divided into longer pigmented and smaller white branch, all 4 bearing filaments, some with terminal swellings; median branch similar but incomplete; interorbital 4 1/2 in head.

Lateral photophores 29 between gill opening and ventral, 14 between ventral and anal; ventral series 7 between isthmus and pectoral, 28 between pectoral and ventral, 14 between ventral and anal, 21 between anal and caudal.

D. 22; A. 37; pectoral rays 2; ventral rays 7.

Length 67 mm. without caudal. (Regan and Trewavas.)

Atlantic.

Eustomias macrophtalmus Parr

Eustomias macrophtalmus PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, Dec.30, 1927, p.67, figs.39 (outline) 36-b. (end of barbel.) N. 22 ° 31 ' W. 74 ° 26 ', 10000 feet.

Eustomias macrophthalmus REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.93, fig.77 (end of barbel) (Caribbean Sea near St.

Croix N. 17° 43' W. 64° 56', 300 meters).

(?) Eustomias micropterygius PARR, Bull. Bingham Oceanogr. Collection, vol.3, art. 2, Dec.30, 1927, p.65, fig.37 (outline). N. 23° 55' W. 77° 9', 4000 to 7000 feet.

Depth 11 1/2; head 7 1/2. Eye 4 1/2 in head; barbel nearly long as fish, stem white, elongate bulb with minute terminal filament; interorbital 6 1/4 in head.

Lateral photophores 32 between gill opening and ventral; 17 between ventral and anal; Ventral series 7 between isthmus and pectoral, 31 between pectoral and ventral, 17 between ventral and anal, 18 between anal and caudal.

D. 25; A. 37; pectoral rays 2.

Length 100 mm. without caudal. (Regan and Trewavas.)

Western Atlantic, Caribbean Sea.

Eustomias macrurus Regan and Trewavas

Eustomias macrurus REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.78, pl.7, fig.2, text fig. 53 (barbel). N. 25° 1' W. 56° 21', 50 meters; N. 33° 18' W. 56° 3', 65 meters.

Depth 13 to 15 1/5; head 8 to 10. Eye 5 to 6 1/3 in head; barbel equals or little longer than head, ending in oblong bulb, white stem with yellowish patches; eye nearly equals interorbital.

Lateral photophores 29 between gill opening and ventral, 16 to 18 between ventral and anal; ventral series 7 between isthmus and pectoral, 28 or 29 between pectoral and ventral, 16 or 17 between ventral and anal, 24 or 25 between anal and caudal.

D. 25 to 29; A. 45; pectoral rays 9; ventral rays 7, origin median in body, fin reaches vent; tail long. Dorsal and anal rays and caudal photophores rather widely spaced.

Length 108 mm. without caudal. (Regan and Trewavas.)

Atlantic.

Eustomias melanobolus Regan and Trewavas

Eustomias melanobolus REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.95, fig.80 -b (end of barbel). N. 21 ° 57 ' W. 22 ° 58 ', 300 meters.

Depth 12; head 8. Eye 5 1/2 in head; barbel 4/5 head, axis black, sheath of stem translucent posteriorly, pigmented anteriorly within short space of oblong bulb, which encloses central black body showing through semi-opaque white tissue of bulb; interorbital 5 1/4 in head.

Photophores indistinct, ventral series 33 between isthmus and ventral, 29 between gill opening and ventral, 14 between ventral and anal, 22 between anal and caudal.

D. 25; A. 42; no pectoral rays.

Length 60 mm. without caudal. (Regan and Trewavas.)

Atlantic.

Eustomias melanonema Regan and Trewavas

Eustomias melanonema REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.85, fig.64-b (end of barbel). N. 13 ° 35 ' W. 30 ° 11 ', 300 meters.

Depth 13; head 8 1/4 to 10 1/2. Eye 5 to 5 1/2 in head; barbel 12/13 of

fish, stem lightly pigmented or unpigmented; 2 bulbs, terminal nearly twice as long as basal, interspace somewhat greater than terminal bulb; 6 pigmented filaments arise together, separated, from terminal end of terminal bulb and unpigmented filament near by; young with terminal bulb bearing 8 pigmented filaments in 3 groups; interorbital 6 in head.

Lateral photophores 32 or 33 between gill opening and ventral, 18 between ventral and anal; ventral series 7 between isthmus and pectoral , 32 or 33 between gill openihg and ventral, 17 or 18 between ventral and anal, 18 to 20 between anal and caudal.

. D. 23 to 26; . A. 37; pectoral rays 3. Length 91 mm. without caudal. (Regan and Trewavas.)

Atlantic.

Eustomias melanostigma Regan and Trewavas

Eustomias melanostigma REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No. 6, March 30, 1930, p.85, pl.8, fig.2, text fig. 64 - a (end of barbel). Caribbean Sea near St. Croix N. 17° 43 ' W. 64° 56 ', 300 meters; N. 17° 45 ' W. 64° 55. 5 ', 300 meters.

Depth 10 1/2 to 11, head 8. Eye nearly 6 in head; barbel 3/4 of fish, stem unpigmented, terminal larger of 2 bulbs, rounded or ovate, interspace twice or somewhat more than terminal bulb; pigment spot at base of terminal bulb bearing 5 pigmented filaments on short stalk and sometimes separate unpigmented filament; interorbital 6 in head.

Lateral photophores 30 to 33 between gill openihg and ventral, 20 or 21 between ventral and anal; ventral series 7 between isthmus and pectoral, 31 to 33 between pectoral and ventral, 19 or 20 between ventral and anal, 19 between anal

and caudal.

D. 26; A. 38; pectoral rays 3.

Length 106 mm. without caudal. (Regan and Trewavas.)

Caribbean Sea.

Eustomias micraster (Parr)

Eustomias bibulbosus subspecies micraster PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, Dec.30, 1927, pp.70, 72. N. 24° 51 W. 76° 38', 7000 feet.

Eustomias bibulbosus micraster PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, Dec.30, 1927, fig.41.

Eustomias micraster REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.84, fig.62 (end of barbel) (Caribbean Sea off Dominica N. 15° 8' W. 61° 31'; Caribbean Sea off St. Croix N. 17° 58. 5' W. 64° 41' and N. 17° 54' W. 64° 54'; north of Virgin Islands N. 19° 01' W. 65° 23'; N. 17° 43' W. 64° 56'; 300 to 1000 meters)

Depth 10 to 12; head 7 to 8 1/2. Eye 5 in head; barbel 1/2 to nearly long as fish, axis unpigmented; 2 bulbs, sometimes subequal, terminal usually smaller, interspace 2 to 4 times diameter of larger; terminal appendage tapering, when complete once to nearly twice long as head, 4 to 8 branches near base and rarely others further along; all branches short filaments, generally with terminal swelling and sometimes with series; interorbital 7 to 8 in head.

Lateral photophores 30 to 33 between gill opening and ventral, 17 to 19 between ventral and anal; ventral series 7 between isthmus and pectoral, 30 to 32 between pectoral and ventral, 17 to 19 between ventral and anal, 18 to 21 between

anal and caudal.

D. 21 to 26; A. 36 to 40.

Length 95 mm. without caudal. (Regan and Trewavas.)

Western Atlantic, Caribbean Sea.

Eustomias monoclonus Regan and Trewavas

Eustomias monochrous REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.105, figs.95 -b (dentition) 97 (end of barbel). Caribbean Sea off St. Croix N. 17 ° 58. 5 ' W. 64 ° 41 ' and N. 17 ° 54 ' W. 64 ° 54 ', 2000 meters.

Depth 11; head 8 1/2. Eye 6 3/4 in head; barbel nearly long as head, stem and basal 3/4 of bulb pigmented; terminal part of bulb separated from pigmented part by constriction and bears pair of minute branched filaments; single small branch, slender, unpigmented, ending in minute bulb with 2 terminal filaments; interorbital 4 1/2 in head.

Lateral photophores 29 between gill opening and ventral, 13 between ventral and anal; ventral series 7 between isthmus and pectoral, 28 between pectoral and ventral and ventral, 13 or 14 between ventral and anal, 19 between anal and caudal.

D. 23; A. 40; pectoral rays 2; ventral rays 7.

Length 76 mm. without caudal. (Regan and Trewavas.)

Caribbean Sea.

Eustomias monodactylus Regan and Trewavas

Eustomias monodactylus REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.107, pl.9, fig.2, text figs. 101 (young) and 102

(end of barbel). Atlantic north of Cape Verde Islands N. 19° 22' W. 24° 6', 500 meters; N. 10° 16' W. 40° 41', 100 meters; N. 36° 28' W. 8° 38', 300 meters; N. 28° 15' W. 56°, 1000 meters.

Depth 10; head 7 to 9. eye 6 to t 1/2 in head; barbel 1/5 to 1/4 of fish, stem basally with axis pigmented or not, with anterior series of black dots; at half length of barbel elongate bulb, beyond which stem unpigmented and ends in small swelling; branches originating about 1/3 length, all unpigmented; median branch rather short and slender, with terminal swelling; lateral branches longer, bearing several filaments, some with swellings; interorbital 5 to 6 in head.

Lateral photophores 28 or 29 between gill opening and ventral, 13 or 14 between ventral and anal; ventral series 7 or 8 between isthmus and pectoral, 28 between pectoral and ventral, 14 between ventral and anal, 21 between anal and caudal.

D. 22 to 24; A. 44 or 45; pectoral with 1 ray; ventral rays 7.

Length 82 mm. without caudal. (Regan and Trewavas.)

Atlantic.

Eustomias obscurus Vaillant

Eustomias obscurus VAILLANT, Exped. Trav. Talisman, Poiss., 1888, p.113, pl.8, figs.3 -a. Azores, 2792 meters; La Nature, 1884, p.185, fig. (no description). - ZUGMAYER, Rés. Camp. Sci. Monaco, vol.35, 1911, p.75 (N. 36° 5' 30" W. 9° 00' 30", 3660 meters). - HJORT, Depths of the Ocean, 1912, p.611 (N. 35° 10' W. 7° 55' off Morocco).

GUNTHER, Rep. Voy. Challenger, vol.22, 1887, p.204 (reference). - GOODE and BEAN,

Oceanic Ichth., 1895, p.111, pl.36, fig. 135 (copied). - PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, Dec.30, 1927, p.63 (copied). - REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.81, fig. 58 (barbels), pl.7, fig.4 (off Madeira, mid North Atlantic, off Cape Blanco, north east of Lesser Antilles, south east of Burmuda, south west of Burmuda, north east of Haiti, north of Porto Rico, Caribbean Sea south of Virgin Islands, east of Bermuda, off Portugal, off Canaries, off Cape Verde Islands, Caribbean Sea near Martinique, Caribbean Sea near St. Croix, off Cape Hatteras, Azores; 25 to 5000 meters).

Eustomias (Eustomias) obscurus NORMAN, Discovery Rep., vol.2, 1930, p.313 (S. 00° 56 ' W. 14° 8 ' 30 ", 250 meters).

Eustomias macrorhynchus PAPPENHEIM, Deutsche Südpolar Exped., vol.15, pt.2, 1914, p.173, text fig.2. N. 24° 41 ' W. 32° 21 ', 20 meters, north west Cape Verde Islands; N. 15° 6 ' W. 27° 44 ', off Cape Verde. - PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, Dec.30, 1927, p.62 (copied).

Eustomias proximus WELSH, Proc. U.S.Nat. Mus., vol.62, art.3, 1923, p.5, figs. 3 - 4. 270 miles southeast from Cape Hatteras; 30 miles southwest from Bermuda; 40 miles north from Little Bahama Bank; 90 miles north from Great Abaco Island; 50 to 100 meters. - PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, Dec.30, 1927, p.63 (compiled).

(?) Eustomias zugmayeri PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, Dec.30, 1927, p.62 (on ZUGMAYER).

Depth 12 4/5 to 14 1/8; head 7 3/4 to 8 1/5, width 2 1/4 to 2 4/5. Snout 2 2/5 to 2 1/2 in head from snout tip; eye 4 1/2 to 6, 2 to 2 1/2 in snout; 1 1/3 to 1 1/2 in interorbital; maxillary reaches 1 2/3 eye diameters behind eye,

length 1 1/10 to 1 1/8 in head from snout tip; teeth unequal, above first, second, 1, 1, 2, 2, 2, 2, 2, 2, 2, 2, 1, 2, 1, 2, 20 groups, ventral to anal, 1, 1, 1, 2, 1, 2, 6 groups, anal to end of series 1, 2, 1, 1, 4 groups; lower row spaced singly, hyoid arch 9, isthmus to pectoral 7, pectoral to ventral 33, ventral to anal 11, anal to caudal 26.

D. 29, origin above base of thirteenth anal ray, fin height 2 4/5 to 3 3/5 in total head length, ends little before end of anal; A. 43, fin height 2 1/3 to 4; caudal 2 1/8 to 2 1/4, forked; pectoral 1 3/4 to 2, rays 3, each with blade like membrane extended to tip; ventral 1, rays 7, with 2 outer detached third and seventh largest, lower second, third and sixth largest; palate toothless; tongue with 3 pairs of strong recurved teeth; interorbital 3 4/5 to 4 1/3, slightly depressed. No gill rakers.

Small elongate luminous body close above maxillary behind eye; similar body below front eye edge, also minute photophore at lower eye edge, besides crescentic luminous body on upper edge of eye. Two rows of photophores on lower or ventral side of body; upper row from gill opening to ventral 1, 1, 2, 1, 2, but not separated as group; least depth of caudal peduncle 1 1/8 to 1 1/5 in eye.

Dark metallic bronze, with numerous minute black punctuations. Iris brownish. Barbel white, bulb pale browmish. Fins whitish.

Atlantic Ocean.

84285 U.S.N.M. 30 Miles south west from Bermuda. Grampus (Bache) Station 10180. In 75 meters. February 15, 1914. Length 132 meters. Type of Eustomias proximus.

84286 U.S.N.M. Grampus (Bache) Station 10169 c. In 50 meters. Feb-

ary 1, 1914. Length 98 mm.

84287 U.S.N.M. Grampus (Bache) Station 10211. In 100 meters. March 22, 1914. Length 98 mm.

84288 U.S.N.M. Grampus (Bache) Station 10186. In 85 meters. February 22, 1914. Length 76 mm.

84289 U.S.N.M. Grampus (Bache) Station 10209. In 100 meters. March 22, 1914. Length 98 mm.

Eustomias parri Regan and Trewavas

Eustomias parri REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.94, pl.8, fig.3, text figs. 78 (end of barbel) 79 (dentition) N. 28° 57' W. 47° 24', 1000 meters.

Depth 9 1/4; head 7. Snout 2 1/4 in head from snout tip; eye 6 3/4, 3 in snout; maxillary extends 1 1/2 eye diameters beyond eye, length 1 1/5 in head from snout tip; barbel 3 1/6 in body without caudal, stem pigmented within short space of ovate bulb, which bears somewhat swollen filament; interorbital 6 in head.

Postorbital luminous body less than pupil. Lateral photophores 28 between gill opening to ventral, 12 between ventral and anal; ventral series 7 between isthmus and pectoral, 29 between pectoral and ventral, 12 between ventral and anal, 20 between anal and caudal.

D. 24, fin height 4 1/2 in total head length; A. 42, fin height 4; least depth of caudal peduncle 8; ventral 1 2/5, origin midway between front eye edge and caudal base; pectoral 6 1/4 in body without caudal, rays 4 or 5, slender, unpigmented.

Length 99 mm. without caudal. (Regan and Trewavas.)

Atlantic.

Eustomias parvibulbus (Parr)

Eustomias bigelowi subspecies parvibulbus PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, Dec.30, 1927, pp.78, 79, N. 22 ° 31 ' W. 74 ° 26 ', 10000 feet.

Eustomias bigelowi parvibulbus PARR, Bull. Bingham.Oceanogr. Collection, vol.3, art.2, Dec.30, 1927, fig.44, text fig. 46 (end of barbel).

Eustomias parvibulbus REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No. 6, March 10, 1930, p.98 (compiled).

Depth 9; head 7. Snout 3 in head; eye 4 1/2, 1 1/2 in snout; maxillary extends 1 1/4 eye diameters behind eye, length 1 1/5 in head; barbel 3 1/3 in body without caudal, stem black, small terminal bulb with 3 median terminal filaments, longest with many very short branches; median branch from stem of barbel slender, pigmented, ends in very small bulb bearing tuft of minute filaments; lateral branches twice as long, 1 2/5 length main stem of barbel, very slender and tapering to fine filaments; interorbital low.

Photophores and fins as in Eustomias bigelowi.

Length 204 mm. without caudal. (Parr, Regan and Trewavas.)

Western Atlantic.

Eustomias patulus Regan and Trewavas

Eustomias patulus REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.86, figs.65 (end of barbel), 67 -a (dentition). N. 26 ° 15 ' W. 20 ° 53 ', 400 meters.

Depth 11; head 7 1/2. eye 5 in head; barbel 3/5 of fish, axis slightly pigmented, ovate bulb bearing branched terminal filament; interorbital 8 in

head.

Lateral photophores 33 between gill opening and ventral, 18 between ventral and anal; ventral series 7 between isthmus and pectoral, 32 between pectoral and ventral, 18 between ventral and anal, 18 between anal and caudal.

D. 24; A. 35; pectoral rays 3; ventrals postmedian.

Length 135 mm. without caudal. (Regan and Trewavas.)

Atlantic.

Eustomias paucifilis (Parr)

Eustomias bigelowi subspecies paucifilis PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, Dec. 30, 1927, p.78, 79. N. 23 ° 58 ' W. 77 ° 26 ', 7000 feet.

Eustomias bigelow paucifilis PARR, Bull. Bingham Oceanogr. Collection, vol.3, art. Dec.30, 1927, fig.45 (end of barbel).

Eustomias paucifilis REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.99, fig.87 (end of barbel) (N. 20 ° 26 ' W. 61 ° 3 ', 300 meters; N. 12 ° 11 ' W. 35 ° 49 ', 2000 meters).

Depth 11 to 12; head 7 1/4 to 7 1/2. eye 6 to 7 in head; barbel nearly long as head, stem pigmented to origin of branches, translucent with pigmented axis beyond; bulb sub-spherical, with pair of pigmented patches, bearing 2 median filaments, 1 or both branched, and pair of forked filaments; branches slender, unpigmented, median longest, tapering, bearing several small filaments; lateral branches shorter, not or barely reaching bulb, forked, sometimes with filaments; interorbital 4 1/2 in head.

Lateral photophores 26 to 28 between gill opening and ventral, 14 or 15 between ventral and anal; ventral series 7 between isthmus and pectoral, 28 be-

tween pectoral and ventral, 13 or 14 between ventral and anal, 20 or 21 between anal and caudal.

D. 23 to 26; A. 39 to 42; pectoral rays 2; ventral rays 7.

Length 70 mm. without caudal. (Regan and Trewavas.)

Atlantic.

Eustomias polyaster Parr

Eustomias polyaster PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, Dec. 30, 1927, figs.7 (outline) 42 (end of barbel). N. 22 ° 31 ' W. 74 ° 26 ', 10000 feet. - REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.88, figs.69 to 71 (ends of barbels; young) (Caribbean Sea north of St. Croix N. 17 ° 49 ' W. 64 ° 54; N. 17 ° 43 ' W. 64 ° 56 '; north of Porto Rico N. 18 ° 35 ' W. 66 °; near St. Croix N. 17 ° 43 ' W. 64 ° 56 '; 300 to 1000 meters).

Depth 11 to 13; head 7 to 8 2/3. eye 4 2/3 to 6 in head; barbel 1/2 to nearly 2/3 of fish, axis white or lightly pigmented; small rounded or oval basal bulb, followed by larger bulb divided by terminal notch into 2 unequal lobes, longer tapering, bearing long branched terminal appendage, stem of which contains several oblong or oval bodies; interorbital 8 in head.

Lateral photophores 33 to 35 between gill opening and ventral, 17 or 18 between ventral and anal; ventral series 7 between isthmus and pectoral, 34 to 36 between pectoral and ventral, 16 or 17 between ventral and anal, 17 or 18 between anal and caudal.

D. 23 to 26; A. 34 to 40; pectoral rays 2.

Length 132 mm. without caudal. (Regan and Trewavas.)

Western Atlantic, Caribbean Sea.

Eustomias pyrifer Regan and Trewavas

Eustomias pyrifer REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.93, fig.76 -b (end of barbel). Caribbean Sea off St. Croix N. 17° 58. 5' W. 64° 41' and N. 17° 54 'W. 64° 54', 100 meters.

Depth 11; head 8. Eye 4 2/3 in head; barbel 1/4 of fish, axis white with minute black dots; pear shaped bulb broader terminally, bearing single filament little longer than itself with 1 branch; interorbital 1 2/3 in head.

Lateral photophores 34 between gill opening and ventral, 17 between ventral and anal; ventral series 7 between isthmus and pectoral, 33 between pectoral and ventral, 15 between ventral and anal, 17 between anal and caudal.

D. 24; A. 35; pectoral rays 2.

Length 135 mm. without caudal. (Regan and Trewavas.)

Caribbean Sea.

Eustomias ramulosus Regan and Trewavas

Eustomias ramulosus REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.107, figs.99 (dentition) 100 (end of barbel). N. 10° 16' W. 40° 41', 100 meters.

Depth 10 1/2; head 7 2/3. Eye 6 1/2 in head; barbel 2/5 of fish, axis pigmented throughout; anterior series of black dots on basal part, little over 1/4 length of elongate bulb; small ovate terminal bulb bearing filament; branches originating less than 1/4 length, all unpigmented and relatively short, less than 1/3 of barbel; slender median branch simple, with 2 small swellings; each lateral branch forked, 1 limb again forked and 1 of forks again divided; divisions of lateral branches with filaments and most filaments with series of swel-

lings; interorbital 5 1/2 in head.

Lateral photophores 27 between gill opening and ventral, 15 between ventral and anal; ventral series 7 between isthmus and pectoral, 27 between pectoral and ventral, 15 between ventral and anal, 21 between anal and caudal.

D. 25; A. 43; pectoral ray long as head and second very small ray in axis; ventral rays 7.

Length 84 mm. without caudal. (Regan and Trewavas.)

Atlantic.

Eustomias regani Norman

Eustomias (Haploclonus) regani NORMAN, Discovery Rep., vol.2, 1930, p.312, fig. 22. S. 00° 56 ' W. 14° 8 ' 30 ", 73 meters, Atlantic.

Depth 11 1/4; head 8 1/5. Snout 3 1/6 in head; eye 5 1/2, 1 3/4 in snout; maxillary extends 2 3/4 eye diameters behind eye, length 1 1/10 in head; barbel 4 1/10 long in body without caudal, small bulb oval, with 3 terminal filaments all longer than bulb, of which 2 posterior broader and anterior longer thread like with 3 minute short basal threads and slight terminal expansion, long filament given off from base of bulb with 2 basal swellings and small terminal filament; interorbital 5 in head.

Postorbital luminous organ very small. Lateral photophores 26 between gill opening and ventral, 12 between ventral and anal; ventral series 7 between isthmus and pectoral, 26 between pectoral and ventral, 12 between ventral and anal, 19 between anal and caudal.

D. 22 (?), fin height 2 in head; A. 38, fin height 1 2/3; caudal 1 1/3; least depth of caudal peduncle 5; pectoral 2, rays 3; ventral rays 7, fin equals head.

Length 58 mm. (Norman.)

Atlantic.

Eustomias schiffi Beebe

Eustomias schiffi BEEBE, Zoologica N.Y. Zool. Soc., vol.13, No.4, March 1932, p.54. Six miles south of Nonsuch Island, Bermuda, 600 fathoms.

Depth 12 2/3; head 8. Snout 5 2/5 in head; eye 5 1/3, impinging on upper profile; premaxillary teeth 14 each side, larger and shorter pair close together at snout tip, interspace then large pair of fangs, rest smaller and irregular, maxillary 18, very small, oblique; below median symphyseal pair, then very large pair followed by 15 teeth; barbel half of body without caudal, long slender stem with thin core of thickly specked black chromatophores, antero-posteriorly stem expands into gradually widening transparent area, then into retort-shaped bulb pale brown on front or lower surface; terminal neck of retort gives off 15 thread like tentacles and just before beginning of neck of retort thick finger like tentacle arises from upper or hind side ending abruptly; from each side of same region of retort branched processes arise like large terminal one, 1 large one on left, 3 lesser on right which break in turn to 3 to 8 elongate transparent threads.

Postorbital luminous body large. Lateral photophores 34 between pectoral and ventral, 15 from ventral; ventral series 8 between isthmus and pectoral, 32 between pectoral and ventral, 15 between ventral and anal, 18 between anal and caudal.

D. 23; A. 37; pectoral rays 2; ventral rays 7.

Black. Length 115 mm. without caudal. (Beebe.)

Bermuda.

Eustomias schmidti Regan and Trewavas

Eustomias schmidti REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.100, pl.9, fig.3 (outline), text figs. 89 (end of barbel) 90(young). N. 31° 6' W. 41° 45', 150 meters; east of Florida N. 26° 13' W. 78° 48', 800 meters; N. 10° 24' W. 54° 38', 300 meters.

Depth 9 3/5 to 10; head 6 4/5 to 7. Snout 2 1/2 to 3 in head from snout tip; eye 5 1/2 to 5 3/4, 2 1/5 to 2 1/3 in snout; maxillary extends 1 3/4 to 2 1/2 eye diameters behind eye, length 1 1/10 to 1 1/5 in head from snout tip; barbel 1 to 1 1/5, stem pigmented, large white bulb divided by constriction into longer oval basal part and shorter rounded terminal part; small filament from base of terminal part of bulb; median branch with short black stem bearing an elongate bulb with pair of small filaments at end; lateral branches unpigmented, 1/2 length of barbel, each with 1 long and 1 or 2 short branches; interorbital 4 1/2 in head.

Postorbital luminous body 1 1/2 in eye. Lateral photophores 27 or 28 between gill opening and ventral, 15 between ventral and anal; ventral series 7 or 8 between isthmus and pectoral, 27 or 28 between pectoral and ventral, 14 or 15 between ventral and anal, 20 to 22 between anal and caudal.

D. 22 to 26; A. 40 to 44; pectoral rays 2; ventral rays 7.

Length 70 mm. without caudal. (Regan and Trewavas.)

Atlantic.

Eustomias silvescens Regan and Trewavas

Eustomias silvescens REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No. 6, March 10, 1930, p.100, pl.9, fig.2 (outline), text fig. 88 (end of barbel)

Caribbean Sea near St. Croix N. 17° 45' W. 64° 55. 5', 800 meters).

Depth 12; head 8. Snout 3 in head from snout tip; eye 4 2/3, 1 3/4 in snout; maxillary extends 1 1/2 eye diameters behind eye, length 1 1/8 in head from snout tip; barbel 3 3/5 in body without caudal, stem pigmented to origin of branches, thence with pigmented axis; bulb broad, with terminal filament; median branch twice as long as head, unpigmented, proximally swollen, containing number of ovate bodies and bearing number of oval bulbs on short stalks; distally tapering, beaded and bearing several filamentous branches, also beaded; each lateral branch gives off small secondary branch, otherwise similar to median branch, although not so long.

Postorbital luminous body equals eye. Lateral photophores 27 between gill opening and ventral, 15 between ventral and anal; ventral series 7 between isthmus and pectoral, 27 between pectoral and ventral, 14 between ventral and anal.

D. 25; A. 42; pectoral rays 2; ventral rays 7.

Length 111 mm. to caudal base. (Regan and Trewavas.)

Caribbean Sea.

Eustomias simplex Regan and Trewavas

Eustomias simplex REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.87, fig.66 -c (end of barbel), 67 -b (dentition). N. 31° 59' W. 59° 52'; N. 20° 26' W. 61° 3'; N. 35° 42' W. 73° 43'; 80 to 300 meters.

Depth 10; head 7 to 7 1/2. Eye 6 in head; barbel 1/2 of fish, ending in simple oblong bulb, stem unpigmented or with scattered black dots, become more

numerous just below bulb; interorbital 6 in head.

Lateral photophores 29 or 30 between gill opening and ventral, 12 to 14 between ventral and anal; ventral series 7 between isthmus and pectoral, 29 or 30 between pectoral and ventral, 12 to 14 between ventral and anal, 16 to 18 between anal and caudal.

D. 23 to 26; A. 34 to 36; pectoral rays 3; ventral postmedian.

Length 75 mm. without caudal. (Regan and Trewavas.)

Atlantic.

Eustomias stigmatopleura Regan and Trewavas

Eustomias stigmatopleura REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.77, pl.7, fig.1, text fig. 5 1 a-b (barbels) 52 a (dentition). N. 27° 33' W. 26° 24'; Caribbean Sea west of St. Lucia N. 13° 47' W. 61° 26'; N. 27° 2' W. 53° 39'; 150 to 4000 meters.

Depth 9 to 12; head 6 to 8. Snout 3 1/3 in head from snout tip; eye 6 to 8, 2 1/5 in snout; maxillary extends 2 eye diameters behind eye, length 1 1/6 in head from snout tip; barbel long as head, with large ovate bulb and pair of long tapering filaments arising posteriorly from just below bulb; stem black, bulb and filaments white; interorbital 5 1/2 to 6 1/2 in head.

Postocular luminous organ 1 2/3 in eye. Lateral photophores 25 to 27 between gill opening and ventral, 15 to 18 between ventral and anal; ventral series 7 between isthmus and pectoral, 25 or 26 between pectoral and ventral, 16 between ventral and anal, 21 or 22 between anal and caudal.

D. 28 to 30, fin height 5 in total head length; A. 37 to 41, fin height 4; caudal 2 3/4; least depth of caudal peduncle 7; pectoral rays 12 or 13, nearly

5 in body without caudal; ventral 6 1/3, rays 8, nearly median, nearly or quite reach anal.

White spots, often more conspicuous than serial photophores, above and below lateral and ventral series. Length 116 mm. without caudal. (Regan and Trewavas.)

Atlantic, Caribbean Sea.

Eustomias tetranema Zugmayer

1913

Eustomias tetranema ZUGMAYER, Bull. Inst. Océanogr. Monaco, No.253, p.2. - PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, Dec.30, 1927, p.77 (copied). - REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.106, figs. 98 (ends of barbels) (N. 32° W. 19° 11', 400 meters; N. 32° 55' W. 21° 51', 500 meters; type)

Depth 11 to 12; head 8 to 8 1/2. Eye 5 1/2 to 6; barbel 2/7 to 2/5 of fish, stem with pigmented axis 1/2 and anterior series of black dots far as origin of branches; terminal half of stem unpigmented, 3 or 4 oblong or oval bodies basally and another at end; branches originating little beyond 1/3 of length, similar, slender, tapering, unpigmented, simple or bearing some minute threads terminally; each branch with 1 to 4 small swellings; interorbital equal to or little greater than eye.

Lateral photophores 28 or 29 between gill opening and pectoral, 14 or 15 between pectoral and ventral; ventral series 7 between isthmus and pectoral, 28 to 30 between pectoral and ventral, 13 or 14 between ventral and anal, 20 or 21 between anal and caudal.

D. 23 to 25; A. 37 to 41; pectoral with 1 ray; ventral rays 7.

Length 110 mm. without caudal. (Regan and Trewavas.)

Atlantic.

Eustomias trewavasae Norman

Eustomias Nominostomias trewavasae NORMAN, Discovery Rep., vol.2, 1930, p.313, fi fig.23. S. 34° 48' W. 16° 36', 1000 meters. South Atlantic.

Depth 11 1/4; head 5 2/3. Snout 2 1/2 in head from snout tip; eye 6, 2 1/4 in snout; maxillary extends 3/4 an eye diameter behind eye, length 1 1/2 in head; barbel 2 5/6 in body without caudal, with 3 bulbs, median close to and somewhat larger than terminal which bears knob like develcpement without filaments, small luminous swelling on stem at some distance from basal bulb, bunch of 6 filaments deeply pigmented at base comes off from stem little terminal of first bulb; interorbital low.

Postocular luminous body small, close above maxillary. Lateral photophores 32 between gill opening and ventral, 16 between ventral and anal; ventral series 7 between isthmus and pectoral, 32 between pectoral and ventral, 16 between ventral and anal, 15 between anal and caudal.

D. 23 (?), fin height 2 2/3 in total head length; A. 35 (?), fin height 2 2/5; caudal 2 (?); least depth of caudal peduncle 7; pectoral 1 1/2, rays 3; ventral rays 7, fin 1 2/3 in head.

Length 60 mm. (Norman)

South Atlantic.

Eustomias triramis Regan and Trewavas

Eustomias triramis REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.99, fig.86 (end of barbel). N. 21° 47' W. 47° 11', 110 meters.

Depth 12; head 8. Eye 5 1/2 in head; barbel scarcely longer than head;

stem pigmented to origin of branches, thence pigmented posteriorly and axis pigmented; pigment extending on to hind part of large subovate bulb; short branches slender, simple, unpigmented, each ending in minute bulb with terminal filament; interorbital 4 1/2 in head.

Lateral photophores 27 between gill opening and ventral, 17 between ventral and anal; ventral series 7 between isthmus and pectoral; 27 between pectoral and ventral, 16 between ventral and anal, 21 between anal and caudal.

D. 25; A. 41; pectoral rays 2; ventral rays 7.

Length 73 mm. without caudal. (Regan and Trewavas.)

Atlantic.

Eustomias trituberatus Regan and Trewavas

Eustomias trituberatus REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No. 6, March 10, 1930, p.91, figs. 73 -b (dentition) 74 -a (end of barbel).

Caribbean Sea near St. Croix N. 17 ° 43 ' W. 64 ° 56 ', 100 to 300 meters.

Depth 10 1/2 to 12 1/2; head 8. Eye 5 to 5 1/2 in head; barbel 1/5 of fish, axis pigmented; 3 bulbs, median very near terminal, which larger than others, ovate, bears minute terminal filament with 2 or 3 branches; interorbital 5 1/2 to 6 in head.

Lateral photophores 31 to 34 between gill opening and ventral, 16 or 17 between ventral and anal; ventral series 7 or 8 between isthmus and pectoral, 32 between pectoral and ventral, 14 to 16 between ventral and anal, 17 or 18 between anal and caudal.

D. 23 or 24; A. 36; pectoral rays 2.

Length 75 mm. without caudal. (Regan and Trewavas.)

Caribbean Sea.

Eustomias variabilis Regan and Trewavas

Eustomias variabilis REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.91, figs.72 (ends of barbels) 73 -a(dentition). N. 12 ° 11 ' W. 57 ° 12 '; Caribbean Sea west of St. Lucia N. 13 ° 47 ' W. 61 ° 26 '; off St. Croix N. 17 ° 43. 7 (W. 64 ° 57 '; N. 17 ° 58. 5 ' W. 64 ° 41 '; west of Jamaica N. 18 ° 22 ' W. 78 ° 38 '; N. 17 ° 43 ' W. 64 ° 56 '; south of St. Croix N. 17 ° 13 ' W. 64 ° 58 '; N. 17 ° 43 ' W. 64 ° 56 '; near Martinique N. 14 ° 38 ' W. 61 ° 16 '; near St. Croix N. 17 ° 43 ' W. 64 ° 56 '; N. 17 ° 43 ' W. 64 ° 56 '; N. 17 ° 43 ' W. 64 ° 56 '; 300 to 4000 meters.

Depth 10 to 13; head 7 to 9. Eye 4 1/2 to 6 in head; barbel 1/5 to 2/5 of fish, stem with pigmented axis; 2 well separated variable bulbs and sometimes 1 or 2 smaller ones between; terminal bulb elongate, ovate or pearshaped, 1 or 2 terminal appendages usually branched, stem and filamentous branches generally beaded; interorbital 5 1/2 to 7 1/2 in head.

Lateral photophores 32 to 34 between gill opening and ventral, 16 or 17 between ventral and anal; ventral series 7 between isthmus and pectoral, 32 or 33 between pectoral and ventral, 15 to 17 between ventral and anal, 16 to 18 between anal and caudal.

D. 21 to 25; A. 33 to 36; pectoral rays 2; ventral rays 7.

Length 145 mm. without caudal. (Regan and Trewavas.)

Western Atlantic, Caribbean Sea.

Eustomias xenobolus Regan and Trewavas

Eustomias xenobolus REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6,

March 10, 1930, p.92, fig.75 (end of barbel). Caribbean Sea near St. Croix N. 17 ° 43 ' W. 64 ° 56 ', 1000 meters.

Depth 14; head 8. Eye 6 in head; barbel 2/9 of fish, axis pigmented; bulb divided, basal part slender, terminal much broader, rounded, with 3 minute filaments on short stalk; interorbital 8 1/2 in head.

Lateral photophores 15 and 16 between ventral and anal.

D. 22; A. 36; pectoral rays 2.

Length 170 mm. without caudal. (Regan and Trewavas.)

Caribbean Sea.

Genus HAPLOSTOMIAS Regan and Trewavas

Haplostomias REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.109. Type Haplostomias tentaculatus REGAN and TREWAVAS.

Snout short. Mouth cleft straight. Premaxillaries and lower jaw with depressible fangs, simple or with rudimentary cusp; maxillary with 1 or more erect teeth followed by row of small oblique teeth. Pair of teeth on vomer; 5 on each palatine; 2 pairs on basibranchials; pairs of well developed teeth on gill arches. Postocular luminous organ large.

Dorsal rays 16 or 17. Anal rays 19 or 20. Dorsal and anal begin at same vertical, anal extending further back. Pectorals normal, rays 5. Ventral rays 7, postmedian.

Distinct from Melanostomias chiefly in its dentition.

ANALYSIS OF SPECIES

1
a. Barbel with 1 bulb; depth 9 to 9 1/2; head 7 1/2 to 7 3/4 tentaculatus.

2
a. Barbel with 2 bulbs; depth 7; head 6 bituberatus.

Haplostomias tentaculatus Regan and Trewavas

Haplostomias tentaculatus REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.109, pl.11, fig.1, text fig. 105 -a (fangs) 106 -a (end of barbel). N. 9° 30' W. 42° 41', 300 meters; N. 29° 31' W. 64°, 200 meters; N. 32° 21' W. 64° 15', 80 meters; N. 24° 43' W. 52° 18', 110 meters; Caribbean Sea north of St. Croix N. 17° 58. 5 W. 65° 45'; near St. Croix N. 17° 43' W. 64° 56', 100 meters. - NORMAN, Discovery Rep., vol.2, 1930, p.314, fig.24 (S. 33° 50' to 34° 13' E. 16° 04' to 15° 49', 850 to 950 meters).

Depth 9 to 9 1/2; head 7 1/2 to 7 3/4. Snout 5 in head from snout tip; eye 6, 1 1/5 in snout; maxillary reaches 3 1/4 eye diameters behind eye, length scarcely less than head from snout tip; barbel 2 2/3 in body without caudal, stem black, white ovate bulb with terminal fringe of 7 to 10 minute filaments; axis of stem prolonged along edge of bulb, terminally free and forming tentacle like appendage; interorbital low.

Postorbital luminous organ long as orbit. Lateral photophores 24 of 25 between gill opening and ventral, 14 between ventral and anal; ventral series 8 - 2 between isthmus and pectoral, 25 to 27 between pectoral and ventral, 14 or 15 between ventral and anal, 9 or 10 between anal and caudal.

D. 16 or 17, fin height 3 2/5 in total head length; A. 19 or 20, fin height 3 1/5; caudal 1 2/5; least depth of caudal peduncle 7; pectoral 1 7/8, rays 5; ventral rays 7, 1 1/10 in total head.

Length 100 mm. without caudal. (Regan and Trewavas.)

Atlantic, Caribbean Sea.

Haplostomias bituberatus Regan and Trewavas

Haplostomias bituberatus REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.110, fig.106 -b (end of barbel) N. 23 ° W. 49 ° 57 ', 110 meters.

Depth 7; head 6. Eye 4 in head; barbel 2 1/4 times head, with slender stem and 2 bulbs, basal and larger terminal; terminal part of axis adherent to proximal bulb, projecting as tentacle like appendage beyond.

Postocular luminous organ little less than eye. Lateral series of photophores 24 between gill opening and ventral, 14 between ventral and anal; ventral series 8 + 2 between isthmus and pectoral, 25 between pectoral and ventral, 15 between ventral and anal; 10 between anal and caudal.

D. 17; A. 20; pectoral rays 5; ventral rays 7.

Length 20 mm. without caudal. (Regan and Trewavas.)

Atlantic.

PSEUDEUSTOMIAS new genus

Type Pseudeustomias myersi new species.

Body elongate, compressed, with short constricted caudal peduncle. Head small, compressed. Snout short. Eye large, well advanced in head. Mouth large, gape curved and mandible well protruded. Maxillary slender, long. Teeth mostly all erect, fixed, rather small, little prominent, larger not greatly exceeding smaller, unicuspid. Small depressible tooth each side of vomer and several small teeth on each palatine. Interorbital low. Barbel short, less than head, with scarcely differentiated terminal bulb. Gill rakers few feeble spinules. Photophores in rows inferior on body. Dorsal and anal well posterior on body, latter with longer base which extends both little before and behind dorsal. Caudal small, apparently only slightly forked. Pectoral slightly less than head. Ventral little longer, inserted far posteriorly or close before anal.

Diagnosis. Chiefly distinguished by its unicuspid, wide set, moderate erect teeth in the jaws, fewer in number than in most genera in the family. Barbel short and simple. Fins as in Microdontostomias.

(ψευδής, false, with reference to its superficial resemblance; Eustomias.)

Pseudeustomias myersi new species.

Depth 9 3/5; head 7, width 2 2/5. Snout 4 in head from snout tip; eye 4, subequal with snout, 1 1/10 in interorbital; maxillary extends eye diameter behind eye, length 1 1/5 in head from snout tip; 6 wide set teeth on each premaxillary, first shortest, second long st or nearly equals eye; each mandibular ramus with 3 small teeth in front and 3 large well spaced lateral ones or mostly falling opposite eye; small depressible tooth each side of vomer and 2 or 3

small teeth in front and 3 large well spaced lateral ones of mostly falling opposite eye; small depressible tooth each side of vomer and 2 or 3 small teeth on each palatine; barbel but slightly less than head, with but slightly swollen terminal bulb ending in single filament little longer than eye; interorbital 4 1/5 in head from snout tip, low, scarcely convex. Gill rakers 0 - 8 weak short denticles, barely half of gill filaments, which about half of eye.

Rounded luminous organ 3/5 of pupil, close below posterior portion of eye; lateral series of photophores 40 between pectoral and ventral, 7 between ventral and anal, then skin damaged; lower or ventral series 12 on isthmus, then 44 to ventral, 5 between ventral and anal, then 16 to caudal.

D. 18, fin height 2 in total head length, origin about 1/2 eye diameter behind anal origin; A. 21, fin height 1 4/5; caudal 2 1/4, apparently only with slight notch; least depth of caudal peduncle 1 3/5 in eye; pectoral 1 3/4 in total head length, rays 6; ventral 1, rays 6.

Blackish, pale brown where skin has slipped and on most of head. Iris neutral dusky. Fins whitish.

Diagnosis. Characters contained largely in the genus.

Type No. U.S.N.M. D. 5125. Nogas Island (W.), S. 11° E., 24 miles (N. 10° 48' E. 121° 48' 30"), Sulu Sea, vicinity of southern Panay. In 411 fathoms. February 3, 1908. Length 108 mm.

(For Mr. Frank J. Myers of Ventnor, New Jersey, an earnest student of the Rotataria, to whom I am indebted for assistance in securing ichthyological material.)

Genus MELANOSTOMIAS Brauer

Melanostomias BRAUER, Zool. Anzeiger, vol.25, No.668, 1902, p.284. Type Melanostomias valdiviae BRAUER, designated by Jordan, Genera of Fishes, pt.4, 1920, p.497.

Nematostomias ZUGMAYER, Bull. Inst. Océanogr. Monaco, No.193, January 20, 1911, p.5. Type Nematostomias gladiator ZUGMAYER, monotypic.

Snout short. Mouth cleft straight. Premaxillaries and lower jaw with depressible curved fangs, each with pointed extension near end so teeth appear bicuspid maxillary with 1 or more erect teeth followed by row of small oblique teeth. Pair of teeth on vomer; row of 3 to 6 teeth on each palatine; usually 2 pairs

Close up the space.

on tongue; well developed teeth on gill arches. Postocular luminous organ well developed. Dorsal rays 13 to 16. Anal rays 16 to 20. Dorsal and anal begin in same vertical, anal extends farther back. Pectoral normal, rays 5 or 6. Ventral rays 7, far back, usually twice as distant from snout end as from caudal base.

ANALYSIS OF SPECIES

1
a. Pectoral rays 5.

1
b. Barbel with transparent terminal part, generally expanded and laterally compressed, containing end of axis and 1 or more rounded or oval opaque white luminous bodies.

1
c. End of axis of barbel straight, barbel 5/6 to 1 1/2 length of head, stem black basally and unpigmented terminally; photophores 23 to 27 in ventral series between pectoral and ventral fins.

1
d. Terminal part of barbel with 2 strips of loose luminous tissue, 1 in front of axis, 1 behind; white body at proximal end of anterior strip, at base of tapering terminal end of posterior strip, at base of tapering terminal appendage usually ends in filament; 23 to 25 photophores in ventral series between pectoral and ventral spilorhynchus.

2
d. Terminal part of barbel with 2 white bodies behind axis and 1 in front.

1
e. Depth 7 1/3; barbel with terminal filament valdiviae.

2
e Depth 9 1/2; barbel without terminal filament philippinus.

3
d. Terminal part of barbel with 2 white bodies behind axis, terminal much larger, with strip of granular luminous tissue in front of axis; no filament; 25 photophores in ventral series between pectoral and ventral melanocaulus.

4
d. Terminal part of barbel with 2 white bodies behind axis, terminal much larger, with series of 6 small ones in front of axis; no filament; 26 or 27 phorophores in ventral series between pectoral and ventral heteropogon.

2
c. Terminal part of axis of barbel forming curve before luminous bulb, which has smaller luminous bodies basally, series of white luminous bodies anterior to axis; 26 to 29 photophores in ventral series between pectoral and ventral.

1
f. Barbel long as head, with 2 series of elongate white bodies not paired or regular and terminally 2 larger and longer on 1 side and still longer 1 on other side; no filament; 26 photophores in ventral series between pectoral and ventral globulifer.

2
f. Barbel twice long as head, basal 2/5 pigmented stem, terminal 3/5 with series of white bodies behind axis, last enlarged and in curve of axis; no filament; 26 or 27 photophores in ventral series between pectoral and ventral biseriatus.

3
f. Barbel 2 to 2 1/2 times head, unpigmented except at base, large white bulb in curve of axis, with some small ones basal; terminal filament present; 27 to 29 photophores in ventral series between pectoral and ventral albibara.

3
c. End of barbel axis inclined forward, single luminous body subterminally in broad membranous expansion; barbel 2 to 3 times head, unpigmented except at base; 27 or 28 photophores in ventral series between pectoral and ventral.

1
g. Luminous bulb of barbel small, membranous expansion produced, tapering,

ending in filament melanops.

2
g. Luminous bulb of barbel large, membranous expansion not tapering,

without filament margaritifer.

4
c. Terminal part of axis of barbel forming curve in front of luminous bulb
no other luminous bodies
bodies basal or before axis; 27 or 28 photophores in ventral series

between pectoral and ventral.

1
h. Barbel stem black, with white spot near basal end of swollen cylindrical terminal part, end with translucent region and curved part of axis; terminal filament melanopogon.

2
h. Barbel stem black, with white ring at middle of length , beyond with narrow translucent expansions before and behind black stem extending to large luminous bulb; no filament macrophotus.

2
b. Barbel simple, 1 1/3 in head, without bulb, tapers into narrow filament mearnsi.

3
b. Barbel with slender stem bearing terminal bulb niger.

2
a. Pectoral rays 4; barbel 1 2/5 in head ends in 3 bulbs, terminal largest with small short filament extended around 1 side from more advanced of 2 small subterminal bulbs vierecki.

Melanostomias spilorhynchus Regan and Trewavas

Melanostomias spilorhynchus REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.112, pl.10, fig.1, text fig. 107 (end of barbel). N. 31° 6' W. 41° 45'; N. 35° 50' W. 44° 55'; N. 39° 56' W. 52° 17'; N. 37° 46' W. 56° 11'; N. 33° 18 W. 56° 03'; N. 29° 52' W. 53° 3'; N. 28° 21' W. 52° 40'; N. 31° 59' W. 59° 52'; N. 32° 14' W. 63° 51'; N. 32° 21' W. 64° 15'; N. 25° 35' W.

53° 13'; N. 34° 15' W. 16° 53'; off Madeira N. 32° 26' W. 16° 59'; N. 32° W. 20° 1'; N. 30° 17' W. 20° 44'; off Cape Verde N. 15° 50' W. 26° 32'; N. 14° 52' W. 28° 4'; N. 12° 59' W. 32° 49'; N. 32° 30' W. 40° ~~30' W. 40°~~ 4'; N. 37° 44' W. 25° 56'; off Madeira N. 32° 45' W. 16° 20'; 65 to 1000 meters.

Depth 8 to 11; head 6 to 8. Snout 6 in head from snout tip; eye 5 to 6, 1 1/5 in snout; maxillary extends 3 1/2 eye diameters behind eye, but slightly less than head from snout tip; barbel 1 1/5 to 1 1/2 times head, terminal part 3 (young) to 5 (adult) in head; stem and basal end of swollen part black in adult, lightly pigmented in young, generally with 1 or 2 white spots near base of stem; swollen part unpigmented distally, with straight axis, before and behind which strip of rather loose luminous tissue and externally membrane, anterior broader, posterior produced in tapering appendage; white bulb at basal end of anterior strip of loose tissue, another at base of terminal appendage; interorbital low.

Postocular luminous organ nearly or quite equal to eye. Bluish white spot on middle of snout and generally 1 before each eye. Lateral series of photophores 23 or 24 between gill opening and ventral, 13 or 14 between ventral and anal. Ventral series 8 + 2 or 3 between isthmus and pectoral, 23 to 25 between pectoral and ventral, 13 or 14 between ventral and anal, 9 or 10 between anal and caudal.

D. 14 or 15, fin height 2 1/2 in total head length; A. 18 to 20, fin height 3 1/4; caudal 1 2/5; least depth of caudal peduncle 7; pectoral 2 1/10; ventral 1.

Length 206 mm. without caudal. (Regan and Trewavas.)

Atlantic.

Melanostomias valdiviae Brauer

Melanostomias valdiviae BRAUER, Zool. Anzeiger, vol.25, No.668, 1902, p.285. West coast of Sumatra, in 614 meters; Deutsch. Tiefsee-Exped. Valdivia, vol. 15, Tiefsee-Fische, 1906, p.56, text fig. 16, pl.3, fig.6 (N. Lat. 0° 15' 2" E. Long. 98° 8' 8", in 614 meters). - REGAN, Trans. Linn. Soc. London, series 2, vol.12, Zool., No.14, 1908, p.218 (near Farquhar Atoll, in 500 to 750 fathoms). - WEBER and BEAUFORT, Fishes Indo Austral. Archipelago, vol.2, 1913, p.115 (compiled).- PARR, Bull. Bingham Oceanogr. Collection, vol.3, art. 2, December 30, 1927, p.44 (compiled). - REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.112, fig. 108-a (end of barbel) (Indian Ocean; N. 29° 24' W. 48° 8', 110 meters).

(?) Melanostomias bartonbeani PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, Dec.30, 1927, p.45, fig.25 (outline). N. 44° 10' W. 52° 35', 150 fathoms. - REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.110 (reference).

Depth 5 7/8; head 6 1/2, width 2 1/3. Snout 5 1/2 in head from snout tip; eye 5 1/2, equals snout, 1 1/3 in interorbital; maxillary reaches preopercle ridge, length 1 1/8 in head from snout tip; barbel 2 in head measured from snout tip, compressed and expanded little terminally where with pair of white ovid bodies or as one each side of median axis and smaller slightly advanced, though in addition greatly larger rounded body beyond which short terminal point slightly extends; interorbital 4, convex. Gill rakers as 9 short, weak denticles along front edge of lower branch of first gill arch; gill filaments 1 1/4 in eye.

Large triangular luminous body on cheek below and behind eye close along upper maxillary edge, long as eye; distinct white photophore on middle of hind preopercle flange; upper lateral series 23 between pectoral and ventral, then

10 to anal origin besides 3 more above front of anal; lower or ventral series 35 from middle of isthmus to ventral of which 8 on isthmus and 2 before pectoral origin, 10 between ventral and anal, then 14 to caudal base.

D. 14, I, fin height 2 1/2 in total head length; A.18, fin height 2 3/5; caudal 1 3/4, forked, lobes pointed and lower much longer and with stronger rays; least depth of caudal peduncle equals eye; pectoral 2 2/5 in total head length, rays 4; ventral 6 1/3 in combined head and body to caudal base, rays I, 6.

Brownish, becoming sooty or blackish brown on under surfaces. Large luminous body on cheek cream white. Iris slate gray. Fins all pale brown.

Atlantic and Indian Oceans.

Apparently differing from Melanostomias valdiviae Brauer slightly in its deeper body, Brauer's text figure showing depth 7 and the colored figure 8 2/5, he evidently only having one specimen the type, 165 mm. as measured to the caudal base. It further varies as the text figure shows 18 anal rays as given in the text though the colored figure has but 17! My specimen has 2 pairs of teeth on the tongue.

4474. D. 5214. Palanog Light, Masbate, 17° W., 2. 60 miles (N. 12° 25 ' 18 " E. 123° 37 ' 15 "), east of Masbate. In 218 fathoms. April 21, 1908. Length 175 mm.

Melanostomias stewarti new species

Depth 9 1/2; head 6 2/5, width 2 4/5. Snout 5 1/2 in head from snout tip; eye 5 2/5, 1 1/10 in snout, 1 3/4 in interorbital; maxillary reaches preopercle ridge, 1 1/5 in head from snout tip; barbel 1 2/5 in total head length, expanded terminally to contain 2 nearly equal ovoid white bodies near end of straight axis and larger one still forward; terminal point not forming filament: interorbital

3 2/3 slightly convex. Gill rakers as 10 minute denticles on lower branch of first gill arch; gill filaments subequal with eye.

Large triangular luminous body below and behind eye close above maxillary, long as eye; distinct photophore at middle of hind preopercle flange; upper lateral series 24 from pectoral to ventral, thence 12 to anal of which 2 above front of anal; lower or ventral series 36 before ventral of which 8 on isthmus and 2 before pectoral origin, 10 from ventral to anal origin, thence 14 to caudal base.

D. 14, fin height 3 1/4 in total head length; A. 16, fin height 2 1/4; caudal 2 1/5, well forked, lobes pointed; least depth of caudal peduncle equals eye; pectoral 2 2/5 in total head, rays 4; ventral 6 4/5 in combined head and body to caudal base, rays I, 6.

Dark brown generally. Luminous organ below eye conspicuously white or cream white. Iris slate gray. Fins pale or brownish white.

Diagnosis. My example seems to agree best with Regan's Indian Ocean specimen of but 55 mm. in its slender body, though its barbel is said to be a little longer than the head. Regan and Trewavas record an Atlantic example, still smaller or only 24 mm. long, with a similar barbel long as head. Both specimens are said to have 2 pairs of teeth on the tongue. My example of the present species differs, however, in that there is only a single pair of small teeth at front of tongue, surely not 2 pairs. It is therefore most closely related to Melanostomias valdiviae in its similar barbel structure, differing chiefly in its slender body.

1434. D. 5405. Ponson Island (N.), S. 79° E., 6. 8 miles (N. 10° 50 ' E. 124° 26 ' 18 "), Dupon Bay, Leyte and vicinity. In 190 fathoms. March 17, 1909. Length.

Melanostomias melanocaulus Regan and Trewavas

Melanostomias melanocaulus REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.113, fig.108 -c (end of barbel). N. 23° 10 " W. 66° 15 ', 900 meters.

Melanostomias bimargaritatus REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.11 (nomen nudum; lapsus for Melanostomias melanocaulus).

Depth 10; head 7. Eye 6 in head; barbel 1 1/4, with slender black stem and compressed translucent terminal part in which straight axis visible, posterior considerable expansion containing larger terminal and smaller basal rounded white body; anteriorly narrow expansion with strip of granular luminous tissue.

Postocular luminous organ nearly long as eye. Lateral photophores 25 between gill opening and ventral, 13 between ventral and anal. Ventral series 8 + 3 between isthmus and pectoral. 25 between pectoral and ventral, 14 between ventral and anal, 10 between anal and cadual.

D. 15; A. 19; pectoral rays 5; ventral rays 7.

Length 55 mm. without caudal. (Regan and Trewavas.)

Atlantic.

Melanostomias heteropogon Regan and Trewavas

Melanostomias heteropogon REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.113, fig.108 b (end of barbel). N. 12° 11 ' W. 57° 12 ', 300 meters; off Madeira N. 33° 26 ' W. 16° 59 ', 900 meters.

Depth 10; head 7. Eye 5 1/2 in head; barbel 1 1/6 to 1 1/3 long as head, with large expanded and compressed translucent terminal part; stem black prox-

imally, then translucent with blackish axis; axis running through expansion, straight, basally black, terminally white and opaque; posterior to axis large oval opaque white body, with or without smaller one basally; anterior to axis series of 3 to 6 small unequal rounded white bodies.

Postorbital luminous organ longer than eye. Lateral photophores 25 between gill opening and ventral, 12 between ventral and anal. Ventral series 8 + 2 between isthmus and pectoral, 26 or 27 between pectoral and ventral, 12 or 13 between ventral and anal, 9 between anal and caudal.

D. 14; A. 18; pectoral rays 5; ventral rays 7.

Length 62 mm. without caudal. (Regan and Trewavas.)

Atlantic.

Melanostomias globulifer new species

Depth 8 1/4; head 7, width 2 1/5. Snout 4 1/2 in head from upper jaw tip; eye 6, 1 3/5 in snout, 2 in interorbital; maxillary well inclined, reaches preopercle ridge, length 1 1/10 in head from snout tip; barbel long as head, with 2 series of elongate white bodies not paired or regular and terminally 2 larger and longer on one side and a still longer one on the other side, median axis extended but slightly forward of more advanced and without filament; interorbital 3 3/5, convex. Gill rakers at 10 minute spinules on lower branch of first gill arch; gill filaments equal eye.

Large triangular luminous body close above maxillary below and behind eye, length equals 1 1/4 eye diameters; photophore at middle of front eye edge and another at middle of lower eye edge; also one about middle of opercle; upper lateral series 25 between pectoral and ventral, then 10 to anal; lower or ventral series 36 before ventral of which 8 on isthmus and 2 before pectoral

origin, 11 between ventral and anal and then 13 to caudal base.

D. 14, fin height 2 1/5 in total head length; A. 17, fin height 3; caudal 1 2/3, well forked, lobes pointed and lower longer, larger and with rays all stronger; least depth of caudal peduncle equals eye; pectoral 2 1/8 in total head length, rays 5; ventral equals head, rays 7.

Dusky or sooty brown generally, nearly blackish brown on belly and under surfaces. Iris neutral gray. Luminous organ on cheek cream white. Fins all pale brownish to whitish.

Diagnosis. Related to the Atlantic Melanostomias biseriatus Regan and Trewavas in structure of the barbel, especially in having 2 sets of globular or ovoid white bodies along the median axis or midrib. From it the present species differs, however, in that the white bodies extend much nearer the base of barbel and its terminus has at least 3 large bodies but no terminal filament.

Type U.S.N.M. No.

2587. D. 5438. Hermana Mayor Light, S. 21° E., 7. 5 miles (N. 15° 54 ' 42 " E. 119° 44 ' 42 "), west coast of Luzon. In 297 fathoms. May 8, 1909. Length 180 mm.

Melanostomias biseriatus Regan and Trewavas

Melanostomias biseriatus REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.113, fig.109 -a (end of barbel). N. 33° 18 ' W. 56° 3 ', 80 to 150 mm.

Depth 10; head 5 to 6. Eye 5 in head; barbel twice long as head; basal 2/5 pigmented, terminal part with white axis, with narrow translucent band in front and behind each including series of white luminous bodies; hind series

starting basally with rather large white body and ending with larger incurving axis; beyond white bulb and end of axis; beyond white bulb and end of axis an expansion without filament.

Postocular luminous organ little longer than eye. Lateral photophores 26 between gill opening and vent, 13 between ventral and anal. Ventral series 8 + 2 between isthmus and pectoral, 26 or 27 between pectoral and ventral, 13 or 14 between ventral and anal, 9 to 11 between anal and caudal.

D. 13 to 16; A. 16 to 17; pectoral rays 5; ventral rays 7.

Length 25 mm. without caudal, (Regan and Trewavas.)

Atlantic.

Melanostomias albibarba Regan and Trewavas

Melanostomias albibarba REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.114, fig 109 -b, (end of barbel). Caribbean Sea west of St. Lucia N. 13° 47' W. 61° 26', 2500 to 3000 meters; off Dominica N. 15° 8' W. 61° 31', 300 meters; Caribbean Sea off St. Croix N. 17° 58. 5' W. 64° 41' and N. 17° 54' W. 64° 54', 300 meters; N. 17° 43' W. 64° 56', 100 to 6oo meters; N. 34° 40' W. 33° 16', 1000 meters; N. 13° 7' W. 57° 20', 4000 meters; N. 29° 24' W. 48° 8', 110 meters.

Melanostomias melanops (not BRAUER) PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, Dec.30, 1927, p.42, fig.24 (end of barbel) (N. 24° W. 77° 17', 6000 feet; N. 23° 58' W. 77° 26', 7000 feet).

Depth 7 1/2 to 10; head 6 to 7 1/2. Eye 5 to 6 in head; barbel 2 to 2 1/2 in head, unpigmented except at base, sometimes with black dots along hind surface; near end with translucent and compressed expansions, that on anterior side of

axis narrow, with series of small white bodies, that on hind side of axis broader, with terminal filament, large white oval body causes axis to curve, with series of smaller ones basal.

Postorbital luminous organ long as eye. Lateral photophores 26 to 28 between isthmus and ventral, 12 or 13 between ventral and anal. Ventral series with 8 + 2 between isthmus and pectoral, 27 to 29 between pectoral and ventral, 13 between ventral and anal, 10 between anal and caudal.

D. 14 to 16; A. 18 or 19; pectoral rays 5; ventral rays 7.

Length 60 mm. without caudal. (Regan and Trewavas.)

Atlantic, Caribbean Sea.

Melanostomias melanops Brauer

Melanostomias melanops BRAUER, Zool. Anzeiger, vol.25, No.668, 1902, p.284.

West coast of Sumatra, in 1024 meters; Deutsch. Tiefsee Exped. Valdivia, vol. 15, Tiefsee-Fische, 1906, p.53, text fig. 15, pl.3, figs.4 - 5 (N. Lat. 5° 23 ' 2 " E. Long. 94° 48 ' 1 " in 1024 meters). - WEBER and BEAUFORT, Fishes Indo Austral. Archipelago, vol.2, 1913, p.114, fig.41 (copied). - PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, December 30, 1927, p.42 (not figure or materials; reference). - REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.114, fig.110 - b (end of barbel) (Caribbean near Martinique N. 14° 38 ' W. 61° 16 ', 1000 meters).

Depth 7 2/5 to 8 7/8; head 6 1/3 to 6 2/5, width 2 to 2 1/8. snout 4 1/4 to 4 2/5 in head from snout tip; eye 5 3/4 to 6 1/2, 1 3/5 in snout, 2 in interorbital; maxillary reaches preopercle ridge, length 1 1/10 to 1 1/8 in head from snout tip; barbel 2 to 2 1/10 times head length, reaches 1 9/10 to 2 2/5 to

ventrals; terminally expanded and compressed, with elongate subterminal dark of brown body, also smaller whitish body, ovioid, from which slender terminal filament arises; interorbital 2 3/4 to 3, convex. Gill rakers as about 12 rather irregular, short, minute spines on lower branch of first arch.

Luminous organ on cheek along upper maxillary edge and below and behind eye 1 1/5 to 2 times eye diameter; conspicuous photophore about center of preopercle flange; upper laterals between pectoral ventral 27, between ventral and anal 10 or 11 and 2 or 3 more continued back above front of anal base; lower laterals 38 to ventral, of which 8 from middle of isthmus and 2 before pectoral origin, 9 from ventral to anal origin, 14 from anal origin to caudal base.

D. 14 or 15, fin height 2 3/5 to 3 in total head length; A. 19, fin height 3 to 3 7/8; caudal 2 to 2 1/2, forked, lobes pointed; least depth of caudal peduncel 1 to 1 1/4 in eye; pectoral 2 1/3 to 2 2/5 in total head length; ventral 1 1/8.

Dark brown, nearly uniform. Iris gray. Fins all pale or whitish.

Indian Ocean, Caribbean Sea. Well figured by Brauer though both of my examples with shorter barbel. He also shows the lower caudal lobe larger and longer. Though in both my examples the ends of the caudal lobes are broken off they show the bases of the lower caudal rays much stronger or larger than the upper.

2632. D. 5502. Macabalan Point Light (Mindanao), S. 35 ° E., 8. 2 miles (N. 8 ° 37 ' 37 " E. 124 ° 35), vicinity northern Mindanao. In 214 fathoms. August 4, 1909. Length 245 mm.

2100. D. 5227. Point Origan, S. 44 ° E., 18. 30 miles (N. 12 ° 53 ' 45 " E. 121 ° 52 ' 30 "), east of Mindoro. In 322 fathoms. May 5, 1908. Length 195 mm.

Melanostomias margaritifer Regan and Trewavas

Melanostomias margaritifer REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.115, fig.110 -a (end of barbel). N. 20 ° 50 ' W. 66 ° 30 ', 200 meters; Caribbean Sea west of Jamaica N. 18 ° 22 ' W. 78 °, 300 meters.

Depth nearly 10; head 6 1/2 to 7 1/4. Eye 5 1/2 in head; barbel 2 to 2 1/4 length of head, unpigmented except at base, few dots on posterior side, minute spot at tip of axis; terminally small compressed translucent expansion anteriorly and broad one posteriorly, including basally large white oval body bending axis forward; no filament.

Postorbital luminous organ long as eye. Lateral photophores 27 between gill opening and ventral, 13 between ventral and anal. Ventral series 8 + 2 between isthmus and pectoral, 27 or 28 between pectoral and ventral, 13 or 14 between ventral and anal, 10 between anal and caudal.

D. 15 or 16; A. 18; pectoral rays 5; ventral rays 7.

Length 80 mm. without caudal. (Regan and Trewavas.)

Western Atlantic, Caribbean Sea.

Melanostomias melanopogon Regan and Trewavas

Melanostomias melanopogon REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.115, fig.111 - a (end of barbel). N. 27 ° 28 ' W. 59 ° 29 ', 300 meters; N. 24 ° 5 ' W. 74 ° 36 ', 1200 to 1500 meters; N. 21 ° 47 ' W. 47 ° 11 ', 110 meters.

(?) Melanostomias melanops (not BRAUER) PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, Dec.30, 1927, p.42 (N. 25 ° 56 ' W. 77 ° 37 ', 5000 feet).

Depth 9 to 10; head 6 2/3 to 7 1/2. Eye 6 to 7 in head; barbel 1 2/3, terminal half swollen, ending in translucent compressed expansion containing large ovate white bulb curving axis and prolonged in thread right up to bulb, except for white spot near basal end of swollen part; pigment spots near end of axis and round thread from bulb; young with basal part of stem black, swollen part lightly pigmented.

Postocular luminous organ long as eye. Lateral photophores 26 to 28 between gill opening and ventral, 12 to 14 between ventral and anal. Ventral series 8 + 2 or 3 between isthmus and pectoral, 27 between pectoral and ventral, 13 or 14 between ventral and anal, 9 or 10 between anal and caudal.

D. 14; A. 17 to 19; pectoral rays 4 or 5; ventral 7.

Length 153 mm. without caudal. (Regan and Trewavas.)

Atlantic.

Melanostomias macrophotus Regan and Trewavas

Melanostomias macrophotus REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.115, fig.111 -b (end of barbel). Caribbean Sea south of Virgin Islands N. 17° 55' W. 64° 48', 400 meters; N. 10° 24' W. 54° 38', 100 meters; off Dominica N. 15° 8' W. 61° 31', 300 to 800 meters; west of Jamaica N. 18° 22' W. 78° 38', 100 meters; near St. Croix N. 17° 43' W. 64° 56', 100 to 500 meters.

Depth 10; head 7. Eye 6 in head; barbel 1 2/3 to 1 5/6 in head, stem black except short white ring about middle of length; beyond with narrow anterior and posterior translucent expansions as far as large yellowish oval bulb, beyond which short, flat, black expansion; axis covered by bulb, ending in black

spot; minute luminous body between terminal part of bulb and axis.

Postocular luminous organ little less than eye. Lateral series of photophores 26 or 27 between gill opening and ventral, 13 between ventral and anal. Ventral series 8 + 2 between isthmus and pectoral, 27 or 28 between pectoral and ventral, 13 or 14 between ventral and anal, 9 or 10 between anal and caudal.

D. 14; A. 18; pectoral rays 5 or 6; ventral rays 7.

Length 82 mm. without caudal. (Regan and Trewavas.)

Western Atlantic, Caribbean Sea.

Melanostomias barton-beani (Parr)

Melanostomias barton-beani (PARR)

Echiostomias barbatum (not LOWE) GOODE and BEAN, Oceanic Ichthyology, 1895, p.109, (not figure) (No. 22364 U.S.N.M.).

Depth 7 2/3; head 6 2/5, width 2. Snout 5 in head from upper jaw tip; eye 4 3/4, slightly greater than snout, 1 2/5 in interorbital; maxillary extends 2 1/2 eye diameters behind eye, length but slightly less than head from snout tip; premaxillary teeth 8, second, fourth, fifth and eight longest; 5 smaller teeth on each maxillary graduated longer to posterior; 11 or 12 teeth on each mandibular ramus, fourth, eighth and last 2 longest; rather long depressible tooth each side of vomer; 6 teeth on left and 7 on right palatine; 2 pairs of recurved teeth on tongue; barbel 1 1/3 in total head length, slender, tapers into narrow filament; interorbital 4 1/4 in head from snout tip, low, depressed

medially. Gill rakers as 10 small clusters of several very small spinules; gill filaments slightly greater than eye.

Rather large triangular luminous body close along maxillary above and below eye posteriorly, long as eye; small photophore close to middle of lower eye edge; lateral series of photophores 21 between pectoral and ventral, 10 between ventral and anal, 14 between front of anal and caudal; lower or ventral series 9 on isthmus, then 21 to ventrals, 10 between ventral and anal and 2 along front anal base.

D. 13, fin height 4 2/5 in total head; A. 18, fin height 4, fin origin opposite dorsal origin; caudal 2, damaged, apparently forked (?); least depth of caudal peduncle 1 1/3 in eye; pectoral rays 5, very filamentous, 2 1/5 in total head length; ventral 2 3/5, rays 8, fin origin same distance before anal origin latter is before caudal base.

Brown, most all lower surface blackish brown. Iris neutral slate. Luminous organ above maxillary pale brownish white. Fin rays all whitish.

Diagnosis. Distinguished by its short simple barbel, apparently without any white luminous bodies. It further differs from most species in the posterior insertion of the ventrals.

Type - No. 22364 U.S.N.M. N. 44° W. 52° . Schooner Seth Stockbridge. Length 221 mm. As Echiostoma barbatum.

(For Dr. Edgar Mearns, an ardent naturalist and student of Philippine Zoology, who collected fishes for the U.S.National Museum.)

Melanostomias niger Gilchrist and Von Bonde

Melanostomias niger GILCHRIST and VON BONDE, Fisher. Marine Biolog. Surv. South Africa, Report No.3, 1922 (1924), No.7, p.6, pl.2, fig.2. Off Table Bay, in

135 fathoms. - BARNARD, Ann. South African Mus., vol.21, pt.1, June 1925, p.142 (type). - PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, December 30, 1927, p.42 (compiled). - REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.111 (compiled).

Depth 7; head 7. Eye 6 in head; barbel 2, slender, ending in white ovate bulb with rounded end.

Postocular luminous organ equals eye. Lateral series of photophores 27 between gill opening and ventral, 13 between ventral and anal. Ventral series 63 between isthmus and caudal.

D. 10; A. 17; pectoral rays 5; ventral rays 7.

Length 220 mm. (Regan and Trewavas.)

South Africa.

Melanostomias vierecki new species

Depth 8 3/4; head 6 2/3, width 2 1/3. Snout 5 in head from snout tip; eye 5, little greater than snout seen in profile, 1 2/3 in interorbital; maxillary extends 3 eye diameters behind eye, length 1 1/8 in head from snout tip; 9 teeth on each premaxillary, with third and sixth pairs longest; 4 moderate teeth at front of maxillary, graduated to posterior; 10 teeth in each mandibular ramus, with third and fifth left, fourth and sixth right, largest; 2 depressible vomerine and 3 or 4 palatine teeth; 3 pairs of small recurved teeth on tongue; barbel 1 2/5 in head, ends in 3 bulbs of which terminal largest and with small short filament extended around one side from more advanced of 2 small subterminal bulbs; interorbital 3 1/2, low, depressed medially. Gill rakers as 3 + 7 short

weak spinules, sometimes double; gill filaments equal eye.

Slender triangular luminous body close above maxillary from below lower hind eye edge, long as eye; small photophore at middle of lower eye edge, long as eye; small photophore at middle of lower eye edge; 1 on middle of opercle; lateral photophores 25 between pectoral and ventral fins, 9 between ventrals and anal and 3 above front of anal; lower or ventral series 8 on isthmus, then 28 to ventrals, 9 between ventrals and anal, 13 from front of anal to caudal.

D. 15, fin height 2 in total head length; A. 17, fin height 2; caudal 1 3/4, well forked, slender lobes pointed; P. with 4 rays, length 2 2/5 in total head length; ventral 1, reaches little beyond front of anal; least depth of caudal peduncle equals eye.

Blackish generally. Teeth and luminous body below eye posteriorly whitish. Iris neutral dusky. Barbel dusky, terminus with bulbs and filament white.

Diagnosis. Differs from all the known species in its slightly different arrangement of the terminal bulbs of the short barbel, in combination with the dentition, photophores and fin formulae, especially the pectorals which have only 4 rays, while in most species 5 or 6.

Type No. . U.S.N.M.

D. 5215. Palanog Light, S. 5° 30' E., 8. 50 miles (N. 12° 31' 30" E. 123° 35' 24"), east of Masbate. In 604 fathoms. April 21, 1908. Length 118 mm.

To the late Henry L. Viereck, an earnest student of the Hymenoptera, to whom I am indebted for collections of fishes.

Genus ECHIOSTOMA Lowe

Echiostoma LOWE, Proc. Zool. Soc. London, vol.2, 1843, p.87. Type Echiostoma

barbatum LOWE, monotypic.

Hyperchoristus GILL, Proc. U.S.Nat. Mus., vol.6, 1883 (1884), p.256. Type Hyperchoristus tanneri GILL, monotypic.

Lower teeth in 2 or 3 series posteriorly. Terminal part of stem of barbel with age bearing a double row of papilliform or filamentous points. Pectoral rays 4, first isolated and produced. Ventral rays 8.

ANALYSIS OF SPECIES

1
a. ECHIOSTOMIAS. Barbel without or with single bulb.

1
b. Barbel with bulb not thicker than stem, bearing simple flat terminal appendage and filaments on stem rather short; postocular luminous organ 5 in head barbatum.

2
b. Barbel with distinct bulb and simple slender terminal appendage and filaments on stem long; postocular luminous organ 4 in head guentheri.

3
b. Barbel without bulb, with slender tapering appendages bearing 2 filaments and 2 filaments on stem short and fleshy; postocular luminous organ nearly 3 in head ctenobarba.

2
a. HYPERCHORISTIUS. Barbel with 2 white bulbs, longer basal and shorter terminal bearing terminal filaments tanneri.

Echiostoma barbatum Lowe

Echiostoma barbatum LOWE, Proc. Zool. Soc. London, vol.2, 1843, p.88. Madeira.

JORDAN and GILBERT, Bull. U.S.Nat. Mus., No.16, 1882, p.287 (reference; - part). - GÜNTHER, Cat. Fishes Brit. Mus., vol.5, 1864, p.427 (reference; not material; Rep. Voy. Challenger, vol.22, 1887, p.206 (reference; not

material. - GOODE and BEAN, Oceanic Ichth., 1895, p.109 (reference; not figure or materials). - JORDAN and EVERMANN, Bull. U.S.Nat. Mus., No.47, pt.1, 1896 (part). - PAPPENHEIM, Deutsche Sudpolar Exped., vol.15, pt.2, March 1914, p.172 (north west of Cape Verde Islands N. 20° 41' W. 31° 53', 3000 feet). - REGAN and TREWAVAS, Danish Dana Exped., Oceanogr. Rep., No.6, March 10, 1930, p.116, fig. 112 -a (type).

Depth 7 2/3; head 7. Snout 5 3/4 in head; eye 5 3/4, 1 in snout; maxillary extends 2 3/4 eye diameters behind eye, length 1 1/8 in head; maxillary with 6 fangs and 38 small oblique teeth; pair of teeth on vomer and series of 9 on each palatine; barbel 1 2/5 in head, rather elongate bulb not thicker than stem, flat and somewhat tapering terminal appendage and double series of 8 fleshy filaments immediately below bulb; interorbital low.

Postocular luminous organ 5 in head. Lateral photophores 25 between gill opening and ventral, 17 between ventral and anal; ventral series 8 + 2 between isthmus and pectoral, 26 between pectoral and ventral, 17 between ventral and anal, 11 between anal and caudal.

D. 13, fin height 3 1/5 in head; A. 16, fin height 2 3/5; caudal 1 3/4, forked, lower lobe longer; least depth of caudal peduncle 6; pectoral rays 1 + 3, 3 1/4 in body without caudal; ventral equals head, rays 8.

Length 285 mm. without caudal. (Regan and Trewavas.)

Eastern Atlantic.

Echiostoma guentheri Regan and Trewavas

Echiostoma guentheri REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No. 6, March 10, 1930, p.117. Madeira.

Echiostoma barbatum (not LOWE) GÜNTHER, Cat. Fishes Brit. Mus., vol.5, 1864, p.427 (Madeira); Rep. Voy. Challenger, vol.22, 1887, p.206, pl.53, fig.B (Madeira specimen).

Depth 9; head 6 1/2, width 1 4/5. Snout 5 in head from snout tip; eye 5 1/4, subequal with snout, equals interorbital; maxillary extends 2 1/2 eye diameters behind eye, length 1 1/10 in head; premaxillary with 6 fangs followed by 22 small oblique teeth on maxillary; pair of teeth on vomer; series of 8 teeth on each palatine; barbel 2 in head, pigmented throughout, with slightly swollen bulb and slender tapering terminal appendage with double series of 7 long tapering filaments on stem below bulb; interorbital 4 1/2 in head, low.

Postocular luminous organ 4 in head. Lateral photophores 25 between gill opening and ventral, 17 between ventral and anal; ventral series 8 + 2 between isthmus and pectoral, 26 between pectoral and ventral, 17 between ventral and anal, 11 between anal and caudal.

D. 14, fin height 2 1/2 in total head length; A. 17, fin height 3 1/3; caudal 2, forked; least depth of caudal peduncle 5; pectoral 1 - 3, length 2 2/3 in body without caudal; ventral equals head, rays 8.

Length 215 mm. total. (Günther, Regan and Trewavas.)

Madeira.

Echiostoma ctenobarba Parr

Echiostoma ctenobarba PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, Dec.30, 1927, p.55, figs. 32 and 33 (end of barbel). N. 23° 55' W. 77° 9', 4000 to 7000 feet. - REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.117 (compiled).

Depth 6 1/5; head 6 3/4. Snout 4 1/5 in head; eye 6,1 1/4 in snout; maxillary extends 2 eye diameters behind eye, length 1 1/6 in head; 9 rather small fangs in each premaxillary, 5 normal erect teeth in each maxillary followed by minute oblique denticles; 8 fangs in each limb of lower jaw, followed by series of 12 pairs of very small teeth; pair of fangs on vomer; series of 12 to 15 teeth on each palatine; barbel 1 3/4 in head, tapering and slender terminally with pair of filaments with swollen ends, basally from these stem with 10 pairs of short fleshy filaments; interorbital low.

Postocular luminous organ nearly twice eye diameter or 2 1/4 in head. Lateral photophores 25 between gill opening and ventral, 17 between ventral and anal, 12 between anal and caudal; ventral series 8 - 2 between isthmus and pectoral, 26 between pectoral and ventral, 17 between ventral and anal.

D. 12, fin height 2 in head; A. 14, fin height 2 3/4; caudal 1 2/3, forked, lower lobe longer; least depth of caudal peduncle 4 2/3; pectoral rays 1 - 3, length 2 4/5 in body without caudal; ventral long as head, rays 8.

Length 285 mm. without caudal. (Parr.)

Atlantic.

Echiostoma tanneri (Gill)

Hyperchoristus tanneri GILL, Proc. U.S.Nat. Mus., vol.6, 1883 (1884), p.256. N. 40° 26' 40" W. 66° 58', 956 fathoms.

Echiostoma tanneri REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.117, fig.113 (ends of barbels) southeast of Bermuda; north east of Lesser Antilles; mid Atlantic; west of Cape Verde Islands; west of St. Lucia; west of Jamaica; south of Cuba; north west of Cuba; between Florida and Cuba; between Haiti and Cuba; near St. Croix; east of Cape

Echiostoma barbatum (not LOWE) GOODE and BEAN, Bull. Essex. Inst., 1879, p.23. - JORDAN and GILBERT, Bull. U.S.Nat. Mus., No.16, 1882, p.287 (part). - GOODE and BEAN, Oceanic Ichth., 1895, p.109, pl.35, fig.130 (old Bahama Channel, 500 fathoms; N. 39° 11' W. 72° 8', 636 fathoms; type of Hyperchoristus tanneri). - PARR, Bull. Bingham Oceanogr. Collection, vol.3, art. 2, Dec. 30, 1927, p.53, fig.31 (end of barbel) (N. 24° 29' W. 77° 29', 8000 feet; N. 24° 11' W. 75° 37', 800 feet; type of Hyperchoristus tanneri).

Echiostoma tanneri REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.117, fig.113 (ends of barbels) (southeast of Bermuda; Cape Verde Islands; west of northeast of Lesser Antilles; mid Atlantic; west of St. Lucia; west of Jamaica; south of Cuba; north west of Cuba; between Florida and Cuba; between Haiti and Cuba; near St. Croix; east of Cape Hatteras; north of Bermuda; 50 to 2000 meters). - NORMAN, Discovery Rep., vol.2, 1930, p.314 (S. 33° 50' to 34° 13' E. 16° 4' to 15° 49', 850 to 950 meters).

Depth

Depth 6 1/2 to 8; head 5 3/4 to 5 4/5, width 2 1/8 to 2 1/4. Snout 3 3/4 to 4 in head from snout tip; eye 4 3/4 to 4 4/5, 1 1/4 to 1 3/5 in snout, 2 in interorbital; maxillary extends 2 to 2 1/2 eye diameters behind eye, length 1 1/10 to 1 1/8 in head; upper teeth with 3 pairs of large fangs, lower with 2 of which first large pair largest of all teeth; barbel inserted before eye, reaches back to hind edge of gill opening; subterminal bulb large as pupil and terminal bulb much shorter, with 4 very short terminal filaments; interorbital 2 3/4 to 3 in head from snout tip, broadly convex though depressed widely medially. Gill rakers 10 inconspicuous clusters of 2 or 3 very minute spinules on lower branch of first arch; gill filaments equal eye.

Small, narrow, pale luminous body, long as eye close above upper maxillary

edge and behind eye; small photophore at lower eye edge; 1 operculcar, low. Upper lateral series of photophores 25 or 26 between gill opening and ventral, 16 between ventral and anal, 14 between anal origin and caudal base; lower or ventral series 8 on isthmus, then 28 or 29 to ventral, 15 between ventral and anal and 2 above front of anal.

D. 12 to 15, fin height 2 1/8 to 2 1/2 in total head length; A. 17 or 18, fin height 3 1/8 to 3 1/5; caudal 1 3/5, forked, lobes slenderly pointed; ventral 1 1/3 to 1 3/5, rays 8; pectoral with long front ray 4 7/8 to 5 in combined head and body to caudal base, hind group of fin rays 3 and 2 in head; least depth of caudal peduncle equals eye.

Blackish brown. Iris grayish. Barbel pale or brownish white. Fins whitish. Atlantic.

33444 U.S.N.M. N. 40° 26' 40" W. 66° 58'. In 956 fathoms. Albatross Station 2083. Length 100 mm. Type of Hyperchoristus tanneri.

35624 U.S.N.M. N. 39° 11' 00" W. 72° 08' 30". Albatross Station. Length 123 mm.

47617 U.S.N.M. Old Bahama Channel. Blake Station CXXV. In 500 fathoms. Length 35 mm. It has the short barbel with the large subterminal bulb and a small terminal bulb. Specimen hardly sufficient for satisfactory description.

Genus PHOTONECTES Günther

Photonectes GÜNTHER, Rep. Voy. Challenger, vol.22, 1887, p.212. Type Lucifer albipennis DÖDERLEIN, Virtually. Photonectes GÜNTHER proposed to replace Lucifer DÖDERLEIN.

Lucifer (not J.V.Thompson) DODERLEIN, Archiv Naturges., 1882, p.26. Type Lucifer albipennis Doderlein.

Trachinostomias PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, Dec. 30, 1927, pp.105, 106. Type Echiostoma margarita GOODE and BEAN.

Dolichostomias PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, Dec.30, 1927, pp.106, 111. Type Photonectes mirabilis PARR.

Melanonectes REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, pp.119. 126. Type Photonectes dinema REGAN and TREWAVAS.

Microchirichthys REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, pp.119, 120, 124. Type Photonectes parvimanus REGAN and TREWAVAS.

Mouth curved, lower jaw prominent. Teeth smaller and more numerous in lower jaw, in groups of 3 to 5 increasing in length backwards; 2 or 3 pairs of teeth on each of first 2 basibranchials. Photophores on isthmus 7 or 8, may be separated from 3 close together below pectoral by an interspace or may form continuous series from isthmus to ventrals. Dorsal and anal membranes variously thin with conspicuous rays or thick with only tips of rays visible. Pectorals absent or reduced to 1 or 2 rays, sometimes with minute third ray.

ANALYSIS OF SPECIES

1a. Dorsal and anal membranes thin, rays conspicuous; ventral photophores 30 to 37 between isthmus and ventral fin.

1b. MELANONECTES. Pectoral rays 2, sometimes minute third ray.

1c. Barbel with small bulb bearing translucent appendage ending in second bulb, nearly large as first, with pair of short filaments dinema.

2c. Barbel with rather large bulb bearing slender translucent appendage ending in minute bulb without filaments leucospilus.

3c. Barbel with large bulb bearing small ovoid appendage ovibarba.

4
c. Barbel with small bulb bearing minute knob braueri.
2
b. No pectoral fins.
1
d. PHOTONECTES. Depth 6 to 9; dorsal and anal fin relatively short; ventrals much nearer caudal than head.
1
e. Barbel shorter than head; stem black, bulb half black and half white, terminal part slender, translucent, white swelling at tip achirus.
2
e. Barbel shorter than head; no bulb, stem black, terminally slender, translucent, with white tip caerulescens.
3
e. Barbel shorter than head; stem black, short, large bulb white, terminal appendage with stalk and translucent leaf like expansion phyllopogon.
4
e. Barbel long as head; stem short, black, bulb white, long terminal part tapering, with luminous bodies, terminal translucent expansion with minute white body mirabilis.
5
e. Barbel longer than head; stem tapering, small white bulb with terminal filament albipennis.
2
d. DOLICHOSTOMIAS. Depth 10 1/2 or more in length; dorsal and anal fins long and low; ventral nearer head than caudal gracilis.
2
a. Dorsal and anal membranes thick, black, only tips of rays visible with age; ventral photophores 42 to 48 between isthmus and ventral.
1
f. MICROCHIRICHTHYS. Two minute pectoral rays.
1
g. Barbel with spherical bulb, much less than 1/2 stem; lateral photophores 34 to 36 between gill opening and ventral, ventral series 36

to 38 between pectoral and ventral parvimanus.

2
g. Barbel with oval bulb 1/2 stem; lateral photophores 30 between gill opening and ventral, ventral series 32 to 34 between pectoral and ventral fimbria.

2
f. TRACHINOSTOMIAS. One long pectoral ray ((?) P. margarita) sometimes minute second ray in young.

1
h. Barbel with stout unbranched black stem, broad compressed truncated white bulb bearing filaments intermedius.

2
h. Barbel without bulb or bulb scarcely thicker than black stem, terminal part bearing several long tapering pigmented branches.

1
i Barbel with oblong median bulb, slightly thicker than stem, branches on bulb and terminally richardi.

2
i Barbel with small bulb not thicker than stem at 4/5 its length, another at end, branched between margarita.

3
i. Barbel without bulb; terminal filament, 2 pairs of long branches near base of filament, basally close together anteriorly 1 or 2 unpaired terminal and 1 or 2 pairs of basal branches monodactylus.

4
i. Barbel without bulb; terminal filament, 1 1/2 or 2 pairs of lateral branches little removed and anteriorly in same region series of 4 pairs of branches flagellatus.

Photonectes dinema Regan and Trewavas.

Photonectes dinema REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.120, figs.114 (outline) 115-b (end of barbel). N. 29° 15' W. 59° 45'; N. 33° 18' W. 56° 3'; N. 25° 11 W. 20° 57'; N.

N. 27° 2' W. 53° 59'; N. 27° 34' W. 51° 47'; N. 26° 37' W. 54° 45'; N. 27° 28' W. 59° 29'; N. 35° 51' W. 66° 43'; N. 29° 56' W. 59° 33'; 150 to 5000 meters.

Depth 7 to 9; head 6 to 7. Eye 5 to 6 in head; maxillary with 1 to 4 erect and 4 to 8 oblique teeth; 2 pairs of teeth on vomer; 1 to 3 teeth on each palatine; barbel 2/3 of head, stem pigmented, white bulb scarcely thicker than stem, with long translucent appendage; end with somewhat smaller bulb bearing pair of short filaments.

Postocular luminous organ 2/3 of eye. Lateral series of photophores 17 to 20 between gill opening and ventral, 14 to 17 between ventral and anal. Ventral series 7 or 8 + 2 between isthmus and pectoral, 20 between pectoral and ventral, 14 to 18 between ventral and anal, 11 or 12 between anal and caudal. Median white spot on snout.

D. 15 to 18; A. 18 to 21; pectoral of 2 short rays and sometimes minute third ray; ventral rays 7.

Length 38 mm. without caudal. (Regan and Trewavas.)

Atlantic.

Photonectes leucospilus Regan and Trewavas

Photonectes leucospilus REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p. 121, fig.115 - a (end of barbel). N. 14° 52' W. 28° 4', 300 meters; N. 28° 15' W. 56°, 2000 meters.

Depth 8 to 9; head 7. Diameter 6 in head; maxillary 0 to 3 erect and 5 or 6 oblique teeth; 2 pairs of teeth on vomer and 2 teeth on each palatine; barbel 1/2 to 2/3 length of head, stem black, large oval white bulb bearing rather long

and slender translucent appendage with very small white bulb at end.

Postocular luminous organ 1/2 to 2/3 long as eye. Lateral photophores 21 or 22 between gill opening and ventral, 14 between ventral and anal. Ventral series 8 + 2 between isthmus and pectoral, 23 between pectoral and ventral, 14 or 15 between ventral and anal, 10 or 11 between anal and caudal.

D. 16; A. 20; pectoral 2 short rays, sometimes minute third ray; ventral rays 7.

White median spot on snout. Length 50 mm. without caudal. (Regan and Trewavas.)

Atlantic.

Photonectes ovibarba Regan and Trewavas

Photonectes ovibarba REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.121, fig.115-c(end of barbel). N. 24° 34' W. 28° 4'; N. 23° 40' W. 43° 26; off Madeira N. 33° 26' W. 16° 59'; N. 32° 55' W. 21° 51'; N. 30° 17' W. 20° 44'; N. 24° 5' W. 74° 36'; N. 27° 2' W. 53° 39'; N. 28° 15' W. 56°; 100 to 4000 meters.

Depth 6 to 9; head 6 to 7. Eye 5 to 6 in head; maxillary with 1 or 2 erect and 3 to 6 oblique teeth; 2 pairs of teeth on vomer and 1 or 2 on each palatine; barbel 1/2 of head, with short stout black stem and large white bulb, broadly rounded at end, bearing small oviod terminal appendage.

Postocular luminous organ long as or shorter than eye. Lateral photophores 21 to 23 between gill opening and ventral, 12 to 14 between ventral and anal. Ventral series 7 or 8 + 2 between isthmus and pectoral, 21 or 23 between pectoral and ventral, 14 or 15 between ventral and anal, 11 or 12 between anal and caudal.

D. 15 to 17; A. 17 to 21; pectoral with 2 short rays; ventral rays 7.

Length 31 mm. without caudal. (Regan and Trewavas.)

Atlantic.

Photonectes braueri (Zugmayer)

Melanostomias braueri ZUGMAYER, Bull. Inst. Oceanogr. Monaco, No.253, 1913, p.3.

- PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, Dec.30, 1927, p.42 (compiled). Photonectes braueri REGAN and TREWAVAS, Danish Dana Exped. Océanogr. Rep., No.6, March 10, 1930, p.121, pl.12, fig.1, text fig. 115 -d (end of barbel) (type).

Depth 8; head 7 2/3. Eye 4 1/3 in head; maxillary with 9 erect and 10 oblique teeth; 2 pairs of teeth on vomer; 3 teeth on each palatine; barbel 1/5 of head, with stout black stem and small white bulb, not thicker than stem, bearing minute terminal knob.

Postocular luminous organ equals eye. Lateral photophores 20 between gill opening and ventral, 14 between ventral and anal, Ventral series 8 + 2 between isthmus and pectoral, 22 between pectoral and ventral, 15 between ventral and anal, 10 between anal and caudal.

D. 18; A. 20; pectoral with 2 short rays; ventral rays 7.

Length 115 mm. without caudal. (Regan and Trewavas.)

Eastern Atlantic.

Photonectes achirus Regan and Trewavas

Photonectes achirus REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.122, fig.116 -a (end of barbel). N. 20° 26' W. 61° 3'; [east of Barbuda N. 17° 41' W. 60° 58'; Caribbean Sea near Martinique

N. 14 ° 38 ' W. 61 ° 16; 150 to 1000 meters.

Depth 6 to 8 1/2; head 6 to 6 1/2. Eye 5 to 6 in head; maxillary with 5 or 6 erect and 7 or 8 oblique teeth; 2 pairs of teeth on vomer and 1 to 3 on each palatine; barbel 1/2 to 2/3 of head, stem pigmented, bulb black basally and white terminally, long slender translucent terminal appendage with small white swelling at tip.

Postocular luminous organ long as eye. Lateral series of photophores 19 to 21 between gill opening and ventral, 11 or 12 between ventral and anal. Ventral series 31 to 34 between isthmus and ventral, 12 to 13 between ventral and anal, 9 to 11 between anal and caudal. Blue luminous tissue as in Photonectes caerulescens.

D. 15 to 17; A. 18 or 19; no pectoral, ventral rays 7. Length 62 mm. without caudal. (Regan and Trewavas.)

Western Atlantic, Caribbean Sea.

Photonectes caerulescens Regan and Trewavas

Photonectes caerulescens REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.122, pl.12, fig.2, text fig. 116 -b. Caribbean Sea south of St. Croix N. 17 ° 13 ' W. 64 ° 58 ', 2000 meters.

Depth 7; head 7. Eye 4 in head; maxillary with 9 erect and 17 oblique teeth; 2 pairs of teeth on vomer; 1 tooth on each palatine; barbel less than 2/5 of head, stem black, slender translucent terminal part with white tip and no bulb.

Postocular luminous organ 3/4 of eye. Lateral series of photophores 21 between gill opening and pectoral, 11 between ventral and anal. Ventral photo-

phores 33 between isthmus and ventral, 12 between ventral and anal, 11 between anal and caudal. Luminous blue mid ventral stripe from chest to ventrals giving rise to short transverse streaks alternating with photophores. Small patches ob blue luminous tissue on sides of isthmus, under lower jaw and above end of maxillary.

D. 18; A. 21; no pectoral; ventral rays 7.

Length 116 mm. without caudal. (Rgenn and Trewavas.)

Caribbean Sea.

Photonectes phyllopogon Regan and Trewavas

Photonectes phyllopogon REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.122, fig.117 - a(end of barbel). Caribbean Sea west of St. Lucia N. 13° 47' W. 61° 26', 300 meters.

Depth 8 1/2; head 6. Eye 6 in head; maxillary with 2 or 3 oblique teeth; 2 pairs of teeth on vomer and tooth on each palatine; barbel 2/3 of head, with short black stem and large rounded white bulb bearing appendage consisting of pigmented clyindrical stalk and terminal translucent leaf like expansion, with serrated edges and 4 terminal filaments.

Postocular luminous organ small. Lateral photophores 19 between gill opening and ventral, 12 between anal and caudal. Ventral series 30 between isthmus and ventral, 11 between ventral and anal, 12 between anal and caudal.

D. 20, A. 22; no pectoral; ventral rays 7.

Length 21 mm. wihtout caudal. (Regan and Trewavas.)

Caribbean Sea.

Photonectes mirabilis Parr

Photonectes mirabilis PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, Dec. 30, 1927, p.111, figs.59 (end of barbel) 60 (detail) N. 24 ° 45 ' W. 76 ° 21 ', 8000 feet. - REGAN and TREWAVAS; Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.123, fig.117 -b (end of barbel) (N. 35 ° 42 ' W. 73 ° 43 ', 300 meters).

Depth 6 2/3; head 7 1/2. Eye 4 in head; maxillary with 4 erect and 15 oblique teeth; 2 pairs of teeth on vomer and 2 teeth on each palatine; barbel long as head, short black stem bearing small posterior luminous body, bulb and long tapering terminal part, pigmented basally, bearing 3 luminous bodies and ending in flat round translucent expansion with minute white body at tip.

Postocular luminous organ little longer than eye. Lateral photophores 24 between gill opening and ventral. Ventral series 32 to 34 between isthmus and ventral, 11 between anal and caudal.

D. 16 or 17; A. 19 or 20 no pectoral; ventral rays 7.

White spot before eye. Three or 2 luminous patches each side of anterior part of mouth floor. Length 60 mm. without caudal. (Regan and Trewavas.)

Atlantic.

Photonectes albipennis (Döderlein)

Lucifer albipennis DÖDERLEIN, Archiv Naturges., 1882, p.26. Inosima.

Phatonectes albipinnis GÜNTHER, Rep. Voy. Challenger, vol.22, 1887, p.212 (compiled). - GOODE and BEAN, Oceanic Ichth. 1895, p.112 (reference).- PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, December 30, 1927, p.114 (compiled). - REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.123 (type).

Depth 7 1/4 to 8; head 6 1/2 to 7, width 2 1/3 to 3. Snout 5 1/2 to 6 in head from snout tip; eye 4 1/5 to 5 1/5, greater than snout, 1 3/4 to 2 in interorbital; maxillary extends 2 1/4 to 3 eye diameters behind eye, length very slightly less than head measured from snout tip; 8 subequal teeth on each premaxillary and 28 to 31 on each ramus of lower jaw; 2 teeth each side of vomer and 2 on each palatine; barbel inserted opposite middle of eye; barbel 4 1/8 to 6 in combined head and body without caudal, with subterminal moderate ellipsoid bulb and variable terminal filament nearly or quite long as eye; interorbital 2 3/5 to 3, rather broadly convex. Gill rakers as 1 + 5 or 6 small groups of very small spines or denticles, usually 2 in each group; gill filaments 1 1/3 in eye.

Small photophore at middle of lower eye edge; rather narrowly triangular luminous organ behind and below eye close along upper maxillary edge; 2 close set white photophores above upper opercular angle and one level with lower eye edge at middle of opercle; lateral photophores 25 to 26 between gill opening and ventral fin, 23 or 24 between ventral fin and caudal base; 6 branchiostegals; 7 or 8 on isthmus to hind edge of gill opening, then lower series 28 to ventral fin, finally 14 above front of anal fin.

D. 15 or 16, fin height 2 3/4 to 3 1/4 in total head length; A. 16 to 18, fin height 2 4/5 to 3 1/4; caudal 1 3/4 to 2, deeply forked, lobes small, slender, sharply pointed; least depth of caudal peduncle 6 to 6 1/3; pectoral 1 1/8 to 1 1/6.

Dark blackish brown generally. Luminous organ below eye posteriorly cream white. Iris neutral black. Photophores on body whitish. Fins all whitish.

Pacific Ocean.

4420. D.5331. Hermana Mayor $I_s$land (E.), N. 13 ^{o} E. 7. 30 miles (N.

15 ° 36 ' 45 " E. 119 ° 47 ' 45 "), off western Luzon. In 178 fathoms. November 22, 1908. Length 148 mm.

3834 and 3835. D. 5626. Kayoa Island (S.E.), S. 15 ° E., 4. 5 miles (N. 0 ° 6 ' E. 127 ° 26 '), between Gillolo and Kayoa Islands. In 265 fathoms. November 29, 1909. Length 182 to 202 mm.

Photonectes gracilis Goode and Bean

Photonectes gracilis GOODE and BEAN, Oceanic Ichth., 1895, p.112, pl.36, fig. 137. Off Martinique, in 472 fathoms. - JORDAN and EVERMANN, Bull. U.S. Nat. Mus., No. 47, pt.1, 1896, p.591 (compiled). - PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, Dec. 30, 1927, p.113, fig.61 (N. 24 ° 29 ' W. 77 ° 29 ', 8000 feet). - REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.123 (compiled).

Depth 14 1/6 (15 1/2 in description); head 8 (8 1/2 in description). Snout 9 in head from snout tip; eye 3 7/8 (4 in description), 3 times snout; maxillary extends 2 eye diameters behind eye, length but slightly less than head; teeth unequal, 3 on each premaxillary, 20 on maxillary anteriorly and posteriorly 16 serrae; 35 teeth on each ramus of mandible; 3 teeth each side of vomer, graduated longer backward; pair of teeth on each palatine; canine near tip of tongue and 3 posterior; barbel imperfect, very short, inserted before eye. Gill rakers very few, minute, spine like.

Small rounded luminous body close above maxillary and below hind half of eye. Lateral row of photophores 21 from gill opening to ventral, 13 from ventral to anal and 13 from anal to caudal; ventral row from isthmus to ventral 32, from ventral to anal 15.

D. 18, low, fin height 3 1/3 in head; A. 21, low, fin height 7 1/2; caudal small; ventral 2 2/3, rays 7; least depth of caudal peduncle 2 1/3 in eye.

Dark brown.

Atlantic Ocean. Parr describes a broad brightly bluish iridescent lateral band extending from behind gill opening to near terminal ends of middle caudal rays. Similar narrow less prominent band on each side of lower half of tail from above ventral bases to caudal peduncle.

U.S.N.M. Off Martinique. In 472 fathoms. Blake Station XL. Length . Type.

Photonectes parvimanus Regan and Trewavas

Photonectes parvimanus REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.124, figs. 118 (outline) 119 - b (end of barbel). N. 29° 15' W. 59° 45', 200 meters; N. 30° 53' W. 54° 7', 100 to 150 meters; N. 28° 37' W. 39° 36', 150 meters; N. 31° 6' W. 41° 45', 600 meters; N. 28° 15' W. 56°, 1000 meters; N. 31° 47' W. 41° 41', 3000 meters.

Depth 8 to 10; head 7 to 8. Eye 6 to 7 in head; maxillary with 2 to 6 erect and 5 or 6 oblique teeth, 2 pairs of teeth on vomer and series of 4 to 6 on each palatine; barbel 1/2 length of head to end of bulb which spherical, much less stem length, bears translucent compressed terminal appendage, which contains network of branching threads, in adult with fringe of filaments along posterior edge, terminates in long filaments with 1 or 2 pairs of branches, which like filaments of fringe, may end in luminous swellings.

Postocular luminous organ small, 1/3 to 3/5 long as eye. Lateral photophores 34 to 36 between gill opening and ventral, 12 or 13 between ventral and anal. Ventral series 10 between isthmus and pectoral, 36 to 38 between pectoral and ventral, 12 to 14 between ventral and anal, 11 to 13 between anal and caudal.

D. 17 to 19; A. 22 to 24; pectoral of 2 minute rays; ventral rays 7.

Length 55 mm. without caudal. (Regan and Trewavas.)

Atlantic.

Photonectes fimbria Regan and Trewavas

Phonectes fimbria REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep,, No.6, March 10, 1930, p.125, fig.119 - 6. N. 32° 55' W. 21° 51', 500 meters.

Depth 9; head 8. Eye 7 in head; maxillary with 7 or 8 erect and 6 to 8 oblique teeth; 2 pairs of teeth on vomer; series of 3 to 5 teeth on each palatine; barbel 1/2 of head to end of bulb, which large, oval, 1/2 long as stem, bears compressed translucent terminal appendage tapering to long filament with pair of branches; basal part of appendage with branching threads within and fringe along hind edge, basal filament of which enlarged and originates from an opaque body.

Postocular luminous organ 1/2 long as eye. Lateral series of photophores 30 between gill opening and ventral, 12 between ventral and anal. Ventral series 10 between isthmus and pectoral, 33 or 34 between pectoral and ventral, 14 between ventral and anal, 12 between anal and caudal. Irregular luminous patch on shoulder on 1 side divided into an upper and a lower.

D. 18; A. 23; pectoral of 2 minute rays; ventral rays 7.

Length 55 mm. without caudal. (Regan and Trewavas.)

Atlantic.

Photonectes intermedius Parr

Photonectes intermedius PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, Dec.30, 1927, p.109, figs. 57 (detail) 58 (end of barbel). N. 32 ° 24 ' W. 64 ° 29 ', 5000 feet; N. 32 ° 24 ' W. 64 ° 29 ', 10000 feet. - REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.125, fig. 129 -a (end of barbel) (N. 30 ° 43 ' W. 60 ° 46; east of Bermuda N. 33 ° 24 ' W. 61 ° 5 '; N. 31 ° 59 ' W. 59 ° 52 '; west of Bermuda N. 33 ° 15 ' W. 68 ° 20 '; N. 34 ° W. 70 ° 1 '; N. 35 ° 7 ' W. 72 ° 38 '; N. 35 ° 51 ' W. 66 ° 43 '; N. 28 ° 15 ' W. 56 °; N. 33 ° 18 ' W. 56 ° 3 '; off Dominica N. 15 ° 8 ' W. 61 ° 31 '; between Florida and Cuba N. 23 ° 13 ' W. 82 ° 21 '; Florida and Cuba N. 23 ° 13 ' W. 82 ° 21 '; Florida Strait N. 24 ° 30 ' W. 80 °; N. 32 ° 14 ' W. 63 ° 51 '; N. 21 ° 57 ' W. 22 ° 58 '; 150 to 2000 meters).

Depth 10 to 11; head 7 to 8 1/2. Eye 6 to 7 1/2 in head; maxillary with 7 to 13 erect and 5 to 7 oblique teeth; 1 or 2 pairs of teeth on vomer and 2 to 5 teeth on each palatine; barbel 2/5 to 2/3 length of head, with stout black stem and compressed white bulb, broadest terminally and truncated, generally somewhat obliquely at end; terminally posterior pigmented tentacle like appendage, usually with white tip, with or without branch or pair of filaments or of short club like appendages with anterior pair of 'tentacles' generally shorter than posterior one; sometimes pair of unpigmented filaments basal to base of posterior 'tentacle(, generally pair of pigmented filaments at base and another pair at base of anterior pair; edge between 'tentacles' with or without 1 unpigmented and 2 or 3.pigmented filaments.

Postocular luminous organ small. Lateral photophores 3. to 34 between gill

opening and ventral, 11 to 14 between ventral and anal. Ventral series 8 to 11 between isthmus and pectoral, 33 to 35 between pectoral and ventral, 12 to 13 between anal and caudal.

D. 16 to 19; A. 18 to 24; pectoral with 1 long ray when complete with expansion near end; ventral rays 7.

Length 86 mm. without caudal. (Regan and Trewavas.)

Atlantic.

Photonectes richardi (Zugmayer)

Echiostoma richardi ZUGMAYER, Bull. Inst. Océanogr. Monaco, No.253, 1913, p.4.

- PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, Dec.30, 1930, p. 52 (reference).

Photonectes richardi REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.126 (type).

Depth 7 1/2; head 7 3/4. Eye 7 in head; maxillary with 13 or 14 erect and 12 or 13 oblique teeth; pair of teeth on vomer, 3 or 4 on each palatine; barbel long as head, black, with unpigmented tip; at middle of length oblong bulb little thicker than stem, bearing terminally pair of branches and median branch; stem beyond bulb with pair of lateral branches basally, long unpaired front branch near middle of length, shorter 1 nearer end; just basal to last branch small luminous body; all branches pigmented and when complete with white tips.

D. 19; A. 22; pectoral of 1 long ray (only on left side); ventral rays 7.

Length 170 mm. without caudal. (Regan and Trewavas.)

Eastern Atlantic.

Photonectes margarita Goode and Bean

Echiostoma margarita GOODE and BEAN, Oceanic Ichth., 1895, p.109, pl.35, fig.131.

N. 28° 38 ' 30 " W. 87 ° 2 ', 420 fathoms. - JORDAN and EVERMANN, Bull. U.S. Nat. Mus., No.47, pt.1, 1896, p.589 (copied).

Phonectes margarita PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, Dec. 30, 1927, p.106, fig.55-b (end of barbel). - REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.126, fig.121-b (compiled).

Depth 7 3/4; head 6 3/4, width 2 1/2. Snout 6 in head from snout tip; eye 6, subequal with snout in profile, 1 2/3 in interorbital; maxillary extends 3 2/3 eye diameters behind hind eye edge, length 1 1/8 in head; upper teeth 6 or 7 on each premaxillary, ~~25 to 28 on each premaxillary~~, 25 to 28 on each maxillary, 35 to 37 on each mandibular ramus; 1 or 2 teeth each side of vomer; 6 on each palatine; barbel inserted little behind eye, length 2 1/3 in head, 2 subterminal luminous organs at terminal fifth; interorbital 3 2/5 in head, convex. Gill rakers 7 minute spinules on lower branch of first arch; gill filaments equal 1 1/5 eye diameters.

Oblong luminous body 1 1/2 in eye, close along upper maxillary edge and entirely behind eye. Lateral series of photophores from gill opening to ventral 30, ventral to anal 11 or 12; lower or ventral series on isthmus to ventral 45, ventral to anal 12 with last 2 above anal fin base, anal to caudal (?)

D. 18 (?), fin height 2 in total head length; A. 24, fin height 2 4/5; caudal 3 (?), forked, small; least depth of caudal peduncle 7 2/3; pectoral absent or rudimentary; ventral 1 1/3, rays 7.

Color pale brown. Inside mouth black. Iris neutral dusky. Barbel black, except short whitish terminal filament. Fins pale. Evidently when fresh color blackish.

Atlantic.

39292 U.S.N.M. N. 28 °38 ' 30 " W. 87 ° 02 '. Albatross Station 2394. Length 332 (?)mm. Type of Echiostoma margarita.

Photonectes monodactylus Regan and Trewavas

Photonectes monodactylus REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.127, pl.12, fig.3, text fig. 122 (end of barbel).

N. 24 ° 5 ' W. 74 ° 36 ', 4000 meters; Caribbean Sea off St. Croix N. 17 ° 58. 5 W. 64 ° 41 ' and N. 17 ° 54 ' W. 64 ° 54 ', 1000 meters; N. 25 ° 11 ' W. 20 ° 57 '; N. 7 ° 22 ' W. 46 ° 51 ', 600 meters; Gulf of Mexico north west of Cuba N. 22 ° 6 ' W. 84 ° 58 ', 600 meters.

Depth 7; head 7. Eye 6 in head; maxillary with 16 erect and 4 or 5 oblique teeth; pair of teeth on vomer and series of 3 to 5 on each palatine; barbel 1/2 length of head (to end of terminal filament); terminal end with 2 pairs of branches, longer and stronger than terminal filament, tapering, black, with slightly dilated unpigmented ends; at short space on anterior part of stem 6 similar shorter branches, longer terminal and shorter basal unpaired, shorter terminal and longer basal pairs.

Postocular luminous organ 3/4 long as eye. Ventral photophores 10 between isthmus and pectoral, 34 between pectoral and ventral, 12 between ventral and anal, 9 between anal and caudal.

D. 18; A. 23; pectoral single long ray (incomplete); ventral rays 7.

Length 250 mm. without caudal. (Regan and Trewavas.)

Atlantic, Caribbean Sea.

Photonectes flagellatus Parr

Photonectes flagellatus PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2,

Dec.30, 1927, p.107, figs. 55 -a(end of barbel) 56 (detail). N. 22° 43' W. 74° 23' W. 74° 23', 8000 feet. - REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.127, fig.121 -a (end of barbel) (compiled).

Depth 7; head 7 2/5. Eye 6 1/3 in head; maxillary with 18 erect teeth; pair of teeth on vomer, 6 or 7 on each palatine; barbel 4/5 length of head, black, with long terminal filament; terminal half with series of 4 anterior and 1 1/2 (or 2) pairs of lateral tapering branches.

Postocular luminous organ shorter than eye. Lateral photophores 30 or 31 between gill opening and ventral, 12 between ventral and anal. Ventral series 11 between isthmus and pectoral, 32 between pectoral and ventral, 11 between ventral and anal.

D. 18; A. 22; pectoral 1 long ray nearly 1/4 of fish, with flat terminal expansion; ventral rays 7.

Length 280 mm. without caudal. (Regan and Trewavas.)

Atlantic.

Genus IDIACANTHUS Peters

Idicanthus PETERS, Monatsber. Akad. Wiss. Berlin, 1876, p.486. Type Idiacanthus fasciola PETERS, monotypic.

Bathyophis GUNTHER, Ann. Mag. Nat. Hist., ser.5, vol.2, 1878, p.181. Type Bathyophis ferox GUNTHER, monotypic.

Body greatly elongate. Mouth cleft slightly curved, lower jaw projecting. Premaxillary and lower jaw with single row of unequal, depressible, bicuspid teeth; maxillary with series of minute oblique teeth. Pair of teeth on vomer;

short row on each palatine; 2 pairs on basibranchials; no teeth on gill arches. Barbel with basal 2/3 black, slender; terminal part white or lightly pigmented, thicker, tapering to fine point, bearing anterior and posterior membranous expansions and basally pair of oblique lateral membranes; near base of swollen part short slender white anterior branch, flanked by pair of membranous lobes, terminally to which 1 conspicuous and few minute luminous bodies. Dorsal rays 54 to 74, long, extend forward nearly to or before ventrals. Anal rays 34 to 49, shorter than dorsal. Dorsal and anal rays rather wide set, except posteriorly and pair of spiny projections at base of each. No pectoral. Ventral rays 6.

ANALYSIS OF SPECIES

1a. Ventral below or behind dorsal origin.

1b. Ventral well behind dorsal origin, distant from anal 1/2 distance from snout — antrostomus.

2b. Ventral little behind dorsal origin, distant from anal less than 1/2 their distance from snout; 22 photophores between ventral and anal origins — atlanticus.

3b. Ventral below fifth to tenth dorsal ray, distant from anal at least 3/4 their distance from snout; 16 to 22 photophores between ventral and anal origins — panamensis.

4b. Ventral below first to eight dorsal rays, distant from anal more than 1/2 their distance from snout; 15 to 18 photophores between ventral and anal origins — fasciola.

2a. Ventral well in advance of dorsal — niger.

Idiacanthus antrostomus GILBERT

Idiacanthus antrostomus GILBERT, Proc. U.S.Nat. Mus., vol.13, 1890, p.54. Off California coast, 603 fathoms. - GOODE and BEAN, Oceanic Ichth., 1895, p.516 (reference). - JORDAN and EVERMANN, Bull. U.S.Nat. Mus., No.47, pt.1, 1896, p.605 (copied). - PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.3, Dec. 30, 1927, p.118 (note). - REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.132 (compiled).

Depth 16 in total length; head 12, width 2 2/3. Snout 3 1/2 in head from snout tip; eye 4 2/3, over first third of maxillary, 1 1/5 in snout, greater than interorbital; maxillary reaches hind edge of gill opening; lower jaw protrudes; upper teeth in 2 groups of 4 or 5, anterior in each very short and others rapidly graduated longer so hind tooth very long; lower lateral teeth at extreme outer jaw edge, anterior inserted farther inward; single small tooth each side of vomer and 2 or 3 posteriorly on palatines; 3 pairs of teeth on tongue directed back; barbel 1 1/3 times head, expanded subterminally; interorbital 6 in head from snout tip. No gill rakers; gill filaments 1/2 of eye.

Four rows of minute photophores on abdomen, lateral row extends but short space behind ventral and median series unite to form single row behind ventral.

D. 57, begins well before ventral, space from snout tip 3 1/3 in total length, front rays more widely spaced; A. 35, like dorsal; caudal forked, rudimentary rays extend forward nearly to dorsal and anal; ventral 1 1/3 in maxillary, rays 5 or 6, fin inserted much nearer front of anal than head.

Black, mandible paler. Base and terminal part of barbel and caudal fin translucent.

Pacific Ocean.

44286 U.S.N.M. In 603 fathoms. Albatross Station 2980. Length 98 mm. Type.

Idiacanthus atlanticus Brauer

Idiacanthus atlanticus BRAUER, Deutsch. Tiefsee Exped. Valdivia, vol.15, Tiefsee-Fische, 1906, p.62, text fig. 21 (head). S. 25° 25' 3" E. 6° 12' 4", 2000 meters, west coast of South Africa; S. 26° 49' 2 E. 5° 54', 4000 meters; S. 28° 28' 8" E. 6° 13' 9", 1200 meters. - BARNARD, Ann. South African Mus., vol.21, pt.1, June 1925, p.136 (compiled). - REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No. 6, March 10, 1930, p.131 (compiled).

Idiacanthus antrostomus (not GILBERT) PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, Dec.30, 1927, p.118 (part).

Depth 14 1/2. Eye 7 in head.

Lateral photophores 28 between gill opening to ventral, 38 between ventral and anal; ventral series 40 between isthmus and ventral, 38 (22 to anal origin) between ventral and anal, 18 between anal and caudal.

D. 54, origin shortly before ventral; A. 35; ventral more than twice as distant from snout tip as from vent, white spots on first ray.

Length 204 mm. without caudal. (Regan and Trewavas.)

South east Atlantic.

Idiacanthus panamensis Regan and Trewavas

Idiacanthus panamensis REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.131, pl.6, fig.2, text fig. 129 (outlines of young). Gulf of Panama N. 7° 30' W. 79° 19', 2500 to 3000 meters; N. 6° 40' W. 80° 47', 800 to 4000 meters; N. 6° 48' W. 80° 33', 1600 to 3600 meters; N. 7° 15' W. 78° 54', 2500 to 3000 meters. - PARR, Bull. Bing-

ham Oceanogr. Collection,vol.2, art.4, Oct. 1931, p.18 (N. 16° 14' W. 99° 36' 30", 625 fathoms; (N. 11° 5' W. 89° 20' 45", 300 fathoms.)

Idiacanthus antrostomus (not GILBERT), GARMAN, Mem. Mus. Comp. Zool., vol. 24, 1899, p.280 (N. 2° 34' W. 82° 29', 1201 fathoms; N. 7° 21' W. 79° 2', 1832 fathoms).

Depth 18 to 25; head 12 to 15. Snout 4 1/8 in head from upper jaw tip; eye 5 3/8 to 8, 2 in snout; maxillary extends 4 eye diameters behind eye, length but slightly less than head from snout tip; barbel 6 1/4 in body without caudal, swelling on anterior filament rather small; interorbital low.

Postocular luminous organ small photophore eye diameter behind eye. Lateral photophores 22 to 24 between gill opening and ventral, 30 to 34 between ventral and anal; ventral series 32 to 36 between isthmus and ventral, 29 to 36 (16 to 22 to anal origin) between ventral and anal, 16 to 21 between anal and caudal.

D. 54 to 67; A. 34 to 39; ventral inserted below fifth to tenth dorsal ray, distant from snout 2 2/5 to 3 times in fish, slightly more (or less) than space from anal origin; ventral length 1 1/3 in head.

Conspicuous bluish white streak below postocular luminous organ, extends forward below eye. On body 3 longitudinal series (2 posteriorly) of bluish white patches, 2 lower series alternating with lateral and ventral photophores. Bases of caudal rays densely covered with minute yellowish bodies. Oblong yellow body in lower caudal lobe. First ventral ray black, with white patches. Length 298 mm. without caudal. (Regan and Trewavas.)

Gulf of Panama.

Idiacanthus fasciola Peters

Idiacanthus fasciola PETERS, Monatsb. Akad. Wiss. Berlin, Dec. 1876 (1877),

p.846. Pacific Ocean, north of Australia, in E. Long. 117°, both at surface; north of New Guinea N. Lat. 1° 4' 5" E. Long. 136° 3' 6". - GÜNTHER, Rep. Voy. Challenger, vol.22, 1887, p.215 (copied). - BRAUER, Deutsch. Tiefsee Exped. Valdivia, vol.15, Tiefsee-Fische, 1906, p.60, text figs. 17 - 20, 22, pl.4, figs.2 - 3 (off Sumatra, below Chagos Archipelago and Seychelles, in 594 to 2500 meters). - WEBER, Siboga Exped., vol.57, Fische, 1913, p.15 (Halamhera Sea, in 1000 meters).- WEBER and BEAUFORT, Fishes Indo-Austral Archipelago, vol.2, 1913, p.108, fig.37 (Halmahera Sea.) - PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, Dec.30, 1927, p.116, text fig.6 (end of barbel) (N. 23° 55' W. 77° 17', 6000 feet; N. 24° W. 77° 47', 6000 feet; N. 32° 24' W. 64° 29', 10000 feet). - REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.129, figs.123, 129 (barbel) (outline), 128 (outlines of young) (type of Idiacanthus ferox; off southern Spain; off Cape Blanco; south east of Bermuda; east of Lesser Antilles; north east of Lesser Antilles; mid north Atlantic; east of Bermuda; south of Newfoundland; north of Lesser Antilles; north of Porto Rico; south of Virgin Islands; west of Canaries; north of Cape Verde Islands; north east of Guiana; west of St. Lucia; off Dominica; east of Barbuda; off St. Croix; Gulf of Panama; west of Jamaica; north west of Cuba; Bahamas; near Martinique; east of Cape Hatteras; Azores; to 5000 meters). - FOWLER, Mem. Bishop Mus., vol.10, 1928, p.34 (compiled). - BEEBE, Zoologica N.Y. Zool. Soc., vol.12, No.1, April 30, 1929, p.13 (N. 39° 15' W. 72°, 600 fathoms).

Bathyophis ferox GÜNTHER, Ann. Mag. Nat. Hist., ser.5, vol.2, 1878, p.181. Middle of North Atlantic, in 2750 fathoms. - GOODE and BEAN, Oceanic Ichth.,

1895, p.129, pl.40, fig.151 (compiled). - JORDAN and EVERMANN, Bull. U.S. Nat. Mus., No.47, pt.1, 1896, p.605 (compiled). - GILCHRIST, Marine Biolog. Rep. South Africa, vol.1, 1913, p.66 (South African Seas). - BARNARD, Ann. South African Mus., vol.21, pt.1, June 1925, p.136 (on GILCHRIST).

Idiacanthus ferox GUNTHER, Rep. Voy. Challenger, vol.22, 1887, p.216, pl.52, fig. D. (type of Bathyopis ferox).

Idiacanthus aurora WAITE, Australian Antarct. Exped. Sci. Rep., ser.C., Zool. bot., vol.3, pt.1, June 30, 1916, p.53, text fig.11 (head above), pl.5, fig. 1. Twenty-five miles northward off Macquarie Island, in 636 to 1450 fathoms. - ARCHEY, New Zealand Journ. Sci. Techn., vol.5, 1922, p.296.

Depth 19 to 27; head 15 to 18. Snout 4 in head from snout tip; eye 5 to 7, 2 in snout; maxillary extends 4 eye diameters behind eye, very slightly less than head from snout tip; barbel 6 1/2 in body without caudal, anterior filament with conspicuous swelling; interorbital low.

Postorbital luminous organ small photophore. Lateral photophores 21 to 25 between gill opening and ventral, 30 to 36 between ventral and anal; ventral series 33 to 36 between ventral and anal; ventral series 33 to 36 between isthmus and ventral, 30 to 36 (15 to 18 to anal origin) between ventral and anal, 14 to 18 between anal and caudal.

D. 54 to 74; A. 38 to 49; ventral 1 1/5 in total head origin below first to eighth dorsal ray.

Small faint white patch below postocular luminous organ. Three longitudinal series of similar patches along body, invisible to naked eye. Knot of similar tissue on upper surface of caudal peduncle. Oblong yellow body with smaller one, in lower caudal lobe. First ventral ray black, with white patches.

76857 U.S.N.M. Albatross Station 2791. Length 168 (?) mm., tail broken.

84550 U.S.N.M. Albatross Station 2751. Length 190 mm.

84587 U.S.N.M. Albatross Station 2663. Length 158 mm.

Idiacanthus niger Regan

Idiacanthus niger REGAN, Ann. Mag. Nat. Hist., ser.8, vol.13, 1914, p.14. New Zealand; Brit. Antarctic Terra Nova Exped., Zool., vol.1, No.1, 1914, p.14, pl.10, fig.2 (type). - ARCHEY, New Zealand Journ. Sci. Techn., vol.5, 1922, p.295 (New Zealand, from grouper's stomach). - PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, Dec.30, 1927, p. (note). - REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.128, fig.124 (type). - NORMAN, Discovery Rep., vol.2, 1930, p.315, fig.25 (barbel) (S. 33 ° to 45 ° E. 9 ° to 17 ° to W. 24 °, 93 to 1000 meters).

Idiacanthus retrodorsalis THOMPSON, Proc. U.S.Nat. Mus., vol.50, 1916, p.462, pl. 4, fig.2. Off Lota, Chile, in 677 fathoms.

Depth 24, length 14 to 15. Snout 4 in head; eye 7 to 8, 1 3/4 in snout; maxillary extends 2 1/2 eye diameters behind eye, slightly less than head from snout tip; barbel 7 1/4 in body without caudal; interorbital low.

Postocular luminous organ very small. Lateral photophores 28 between gill opening and ventral, 35 between ventral and anal; ventral series 39 or 40 between isthmus and ventral, 35 (20 or 21 to anal origin) between ventral and anal, 17 between anal and caudal.

D. 55 to 60; A. 36 to 38; ventral well before dorsal, distant from anal origin 4/5 their space from snout end.

Length 380 mm. without caudal. (Regan and Trewavas.)

Off New Zealand, Chile.

Family MALACOSTEIDAE

Body elongate, deepest at head and tapering backward. Snout extremely short. Eye very large. Mouth enormous, ends of jaws extending beyond bases of pectoral fins and jaws not connected with sides of head back of orbit. Lateral edges of upper jaw formed by premaxillaries only. Teeth pointed, unequal in jaws, none on palate. One or no barbel, but cylindrical muscular band connects symphysis of very thin lower jaw with front of hyoid bone. No gill rakers. Body scaleless. Dorsal and anal fins alike, far back, opposite. No adipose fin. Tail diphycercal, caudal small and emarginate. Pectoral rudimentary. Ventral slender.

ANALYSIS OF GENERA

1a. Small luminous organ below anterior part of eye in males only; no barbel; no pectoral fin — Photostomias.

2a. A large subocilar luminous organ; pectoral fin present.

1b. Barbel present — Aristostomias.

2b. No barbel — Malacosteus.

Genus PHOTOSTOMIAS COLLET

Photostomias COLLETT, Bull. Soc. Zool. France, vol.14, 1889, p.291. Type Photostomias guerni COLLETT, monotypic.

Thaumastomias ALCOCK, Ann. Mag. Nat. Hist., series 6, vol.6, 1890, p.220. Type Thaumastomias atrox ALCOCK, monotypic.

Snout short. Fangs fixed, slender, curved, pointed; about 10 in premaxillary of which second may be enlarged; 2 long lower front pairs followed on each side

by series (to 25) of smaller uneven teeth; maxillary with series (to 30) of small oblique teeth. Vomer toothless. Series of small teeth on each palatine, increasing in size backwards; 5 to 7 pairs of teeth in 3 groups on basibranchials; teeth on gill arches fairly small. No barbel. Postocular luminous organ; rounded subocular organ below front eye edge in adult males. Serial photophores approximately equidistant, except 2 subcontiguous organs on each side at end of series on isthmus; series on branchiostegal membrane. Dorsal and anal subequal with thin, colorless fin membranes. Pectoral present. Ventral with 6 rays, long and slender, reaching middle of anal.

Apparently a single species as no distinctive characters have been established for Photostomias atrox Alcock from the Indian Ocean.

Photostomias guerni Collett

Photostomias guerni COLLETT, Bull. Soc. Zool. France, vol.14, 1889, p.291. N. 38° 34 ' 30 " W. 30° 43 ' 30 ", 1138 meters, off Azores.

Photostomias guerni LUTKEN, Kon. Dansk. Vidensk. Selsk. Skrift. Kobenhavn, ser. 6, vol.7, 1892, p.280, fig. (Atlantic). - GOODE and BEAN, Oceanic Ichth., 1895, p.115, pl.37, fig.140 (compiled). - COLLETT, Rés. Camp. Sci. Monaco, vol.10, 1896, p.131, pl.1, fig.5 (type). - ZUGMAYER, Rés. Camp. Sci. Monaco, vol. 35, 1911, p.65, pl.3, figs. 1 -1-a (N. 31° 39 ' to N. 31° 40 ' 30 " W. 42° 50 ' to W. 42° 44 ' 30, 3465 meters). - PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, December 30, 1927, p.102, text fig.13 (N. 20° to 32° W. 64° to 77°, 4000 to 10000 feet). - REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.134, pl.13, fig.1, (N. 12° to 38° W. 7° to 84°, 50 to 5000 meters). - NORMAN, Discovery Rep., vol.2, 1930, p.317 (S. 00° to 56 ' W. 14° 8 ' 30 ", 250 meters; N. 13° 25 ' W.

18° 22', 900 meters; N. 6° 55' W. 15° 54', 800 meters).

Photonectes guernei REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.136, figs. 130 - 131.

Thaumastomias atrox ALCOCK, Ann. Mag. Nat. Hist., series 6, vol.6, 1890, p.220, pl.8, fig.7. N. 18° 26' E. 85° 24', 1310 fathoms, off Madras coast. - GOODE and BEAN, Oceanic Ichth., 1895, p.115 (compiled). - ALCOCK, Journ. Asiatic Soc. Bengal, vol.65, pt.2, 1896, p334 (reference.)

Thaumatostomias atrox GOODE and BEAN, Oceanic Ichth., 1895, pl.37, fig.141 (copied).

Photostomias atrox ALCOCK, Cat. Deep Sea Fishes Indian Mus., 1899, p.150 (Bay of Bengal and off Andamans, 606 to 1310, fathoms; remarks on GOODE and BEAN's incorrectly copied figure); Illustrat. Zoology Investigator, Fishes, pt.7, 1900, pl.30, fig.2 (type). - REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.137 (type).

Photostomias guerni (not COLLETT 1889) COLLETT, Rés. Camp. Sci. Monaco, vol.10, 1896, p.131 (part).

Depth 6 3/4 to 7; head 4 3/5 to 4 3/4, width 2 to 3. Snout 5 1/2 to 5 4/5 in head from snout tip; eye 5 1/4 to 6, greater than snout, 1 1/4 to 1 3/5 in interorbital; maxillary extends 3 1/4 to 3 1/2 eye diameters behind eye, length but slightly less than head; 7 to 9 rather large premaxillary teeth each side, of mandibular usually 2 pairs enlarged anteriorly; interorbital 3 1/3 to 3 3/5 in head from snout tip, convex. No gill rakers; gill filaments about half of eye.

Narrowly triangular postorbital luminous organ 1/2 of eye. Minute photophores on body insonspicuous, lateral series 15 or 16 between pectoral and ventral, 17 between ventral and anal, then 17 to caudal; lower or ventral series 10 branchi-

ostegals, 9 on isthmus, then 15 to ventrals, 19 between ventral and anal, 13 along anal base.

D. 23, fin height 2 1/8 to 2 1/2 in total head; A. 24 to 26, fin height 2 1/5; caudal 2 1/5, forked, slender lobes pointed; ventral 2 2/5 in combined head and body to caudal base; least depth of caudal peduncle 1 to 1 1/3 in eye.

Largely blackish or dark brown. Head paler. Iris neutral gray. Fins whitish.

83837 U.S.N.M. Albatross Station 2393. Length 59 mm.

91401. U.S.N.M. In 1650 meters. Albatross Station 20024. November 22, 1919. Length 68 mm.

Genus ARISTOMIAS Zugmayer

Aristostomias ZUGMAYER, Bull. Inst. Oceanogr. Monaco, No.253, 1913, p.1. Type Aristostomias grimaldi ZUGMAYER.

Zastomias GILBERT, Proc. U.S.Nat. Mus., vol.48, 1915, p.322. Type Zastomias scintillans GILBERT, orthotypic.

Mouth cleft straight. Fangs fixed, curved, strongly barbed. Premaxillaries with 6 or 7 fangs each side, not enlarged. Lower jaw with 2 pairs of long anterior fangs, fitting into grooves on snout, followed each side by 5 to 9 smaller fangs. Vomer toothless. Long series (to 12) of teeth on each side of palatine; 1 to 3 pairs of teeth on first basibranchial, 2 to 4 pairs on second, none on gill arches. Crecentic subocular luminous organ close to lower front border of orbit; above its hind end small double organ and behind postocular luminous organ. Barbel slender, usually ending in small swelling. Serial photophores show tendency to form small linear or clustered groups; 3 pairs before pectoral always lying between right and left members of 2 preceding pairs. Dorsal and anal begin at same vertical, bases fleshy, rays partly covered by thick black

membrane. Paired fins small; pectoral rays fine, 6 to 17; ventral 6, median or postmedian.

The following nominal form is without sufficient details of its photophores or luminous organs:

Aristostomias uncodentatus Borodin

Aristostomias uncodentatus BORODIN, Proc. New. England Zool. Club, vol.11, Jan. 10, 1930, p.90. N. 33 ° W. 64 °, 1200 meters.

ANALYSIS OF SPECIES

1
a. Ventral photophores more or less divided by gaps, but without groups of close set photophores; pectoral rays 4 to 8.

1
b. Lateral photophores between gill opening and ventral without group of close set photophores; barbel of adult without distinct bulb; curved strip of luminous tissue in front of and below eye and subocular organ

lunifer.

2
b. Lateral photophores between gill opening and ventral with group of close set photophores posteriorly; barbel with ovate or club shaped bulb

scintillans.

2
a. Ventral photophores between pectoral and ventral divided into linear or clustered groups of close set photophores; those between gill opening and ventral similar except first 3 or 4 photophores, which spaced.

1
c. Pectoral rays 6 to 10; postocular luminous organ much shorter than eye.

1
d. Ventral photophores 14 to 18 between gill opening and ventral; postocular organ 1/4 eye or less; no series of luminous dots on head; barbel with small bulb which borader basally xenostoma.

2
d. Ventral photophores 18 to 20 between gill opening and ventral; postocular

organ 1/2 to 2/3 eye; series of luminous dots running backwards from between subocular and postocular organs; barbel with conspicuous oval or club-shaped bulb tittmanni.

2
d. Ventral photophores 16 between gill opening and ventral; postocular organ 1/4 to 3/5 eye; series of luminous dots as in tittmani; barbel with long slightly thickened part grimaldii.

2
c. Pectoral rays 14 to 17; postocular luminous organ about long as eye polydactylus.

Aristomias grimaldii Zugmayer

Aristostomias grimaldii ZUGMAYER, Bull. Inst. Océanogr, Moncao, No.253, 1913, p.1.
REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.141, pl.14, fig.2 (type; N. 5° to 35° W. 51° to 82°, 50 to 1500 meters).

Depth 4 2/3 to 6; head 3 2/5 to 4. Snout 3 2/5 to 4 1/2; eye 5 to 6; barbel 1/3 to 3/5 of fish, ends in slight elongate swelling, often curved, probably luminous only at terminal end.

Subocular luminous organ 2/3 to nearly long as eye; postocular 1/4 to 3/5 of eye; series of small bluish luminous spots running backward from between subocular and postocular organs; group of similar spots below subocular organ and sometimes before eye. Lateral photophores 16 between gill opening and ventral, first 4 oblique rest in 4 close linear groups of 2 to 4; 15 or 16 between ventral and anal, 1 or 2 close groups of 3 to 4 at beginning, generally 1 at end, rest spaced. Ventral series 5 + 3 between isthmus and pectoral, 14 to 16 between pectoral and ventral, in 5 close groups of 2 to 4, some clustered, 15 to

17 between ventral and anal in close linear groups of 1 to 4 or 3 to 7 in middle spaced, 10 or 11 between anal and caudal.

D. 21 to 26; A. 27 to 32; pectoral 7 to 10; ventral 6, midway from snout tip or front eye edge and caudal base.

Length 117 mm. without caudal. (Regan and Trewavas.)

Atlantic Ocean, Caribbean Sea.

Aristostomias lunifer Regan and Trewavas

Aristostomias lunifer REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No. 6, March 10, 1930, p.138, pl.13, fig.2, text fig. 132 (end of barbel). N. 19 ° 1 ' W. 65 ° 23 ', 600 meters, north of Virgin Islands; N. 35 ° 42 ' W. 73 ° 43 ', 300 meters; ~~N. 35 ° 42 ' W. 73 ° 43 ', 300 meters.~~

(?) Aristostomias scintillans (not GILBERT) PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, Dec.30, 1927, p.96, fig.54 (N. 23 ° 39 ' W. 76 ° 41 ', 7000 feet; N. 32 ° 19 ' W. 64 ° 33 ', 8000 feet).

Depth 6 1/2 to 7; depth 4 to 4 2/3. Snout 3 1/2 in head; eye 5 to 5 1/2; barbel 1/3 to 3/5 fish, end luminous, hardly enlarged.

Subocular luminous organ 1/2 to 2/3 eye; postocular organ 1/3 to 1/2; semicircular strip of luminous tissue before and below eye and subocular organ. Lateral photophores 18 or 19 between gill opening and ventral, sometimes gap after fourth, no close set groups but last 2 sometimes closer together than rest; 16 to 18 between ventral and anal, last 4 to 7 forming close group. Ventral series 5 + 3 between isthmus and pectoral, 17 or 18 between pectoral and ventral divided into groups by gaps after sixth, ninth and tenth and sometimes thirteenth or fourteenth but none of groups with photophores close set; 13 or 14 between ventral

and anal with gaps after third and seventh; 10 or 11 between anal and caudal, last 3 or 4 forming close group.

D. 20 to 24; A. 26 to 29; pectoral 7 or 8; ventral 6, median or nearer caudal.

Length 93 mm. without caudal. (Regan and Trewavas.)

Western Atlantic, Caribbean Sea.

Aristostomias polydactylus Regan and Trewavas

Aristostomias polydactylus REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.141, pl.14, fig.3, text fig. 137. N. 17° to 25° W. 45° to 82°, 50 to 927 meters, Western Atlantic and Caribbean Sea.

Depth 5 to 7; head 3 to 3 3/4. Snout 3 to 3 3/4 in head; eye 5 to 7; barbel 2/5 to nearly 3/4 of fish, ending in narrow elongate bulb.

Subocular luminous organ long as eye; numerous small greenish spots below and before eye, dense streak between subocular and postocular organs and trails of spots backwards. Lateral photophores 15 to 17 between gill opening and ventral, first 3 or 4 ascending obliquely, these and next 2 to 5 spaced, rest in close linear groups of 2 to 4; 17 or 18 between ventral and anal, first 3 or 4 close, rest spaced except sometimes last 2 or 3. Ventral series 5 + 3 between isthmus and pectoral; 15 to 17 between pectoral and ventral, in 6 or 7 groups of 1 to 4; 15 to 18 between ventral and anal, all spaced or first 2 or 3 or first and last 3 in close group.

D. 21 to 26; A. 26 to 29; pectoral 14 to 17; ventral 6, nearly median.

Length 60 mm. without caudal. (Regan and Trewavas.)

Atlantic; Caribbean Sea.

Aristostomias scintillans (Gilbert)

Zastomias scintillans GILBERT, Proc. U.S.Nat. Mus., vol.48, 1915, p.322, pl.15, fig.4. Monterey Bay, California, 389 to 551 fathoms.

(?) Aristostomias scintillans PARR, Bull. Bingham Oceanogr. Collection, vol.3, art.2, 1927, p.96, fig.11 (part; type; N. 23° 39' W. 76° 41', 7000 feet;). - REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.138 (note).

Depth 5 1/2; head 3 7/8, width 3. Snout 4 in head; eye 5, 1 1/2 in snout, 1 3/5 in interorbital; maxillary extends 3 eye diameters behind eye, length 1 1/10 in head; pair of canines outside premaxillaries, when mouth closes in deeper grooves or sockets beneath posterior nostrils, posteriorly 5 pairs of shorter canines of about equal length; maxillary with minute retrorse teeth; mandible with pair of strong front canines; when mouth closes lie in shallow grooves in front surfaces of snout and upper jaw; palatine teeth small, uniserial; barbel inserted below eye, half combined head and body to caudal base, reaches beyond ventral base, with smooth clavate terminus; interorbital 4 2/3 in head, convex. No gill rakers; gill filaments 1 1/2 in eye.

Head, body and fins with numerous, minute luminous bodies, many arranged in vertical intersegmental lines. Narrow curved luminous body on infraorbital and another larger and ovoid below and behind eye. Lateral row of photophores low, with occasional groups of 4 or 5 closely crowded spots, widely spaced; ventral series low, not made out.

D. 21, fin height 2 7/8 (?)in head; A. 27, fin height 3 (?); caudal 1 2/5, damaged, forked (?); pectoral 1 4/5 in head, rays 1 + 3, all free filaments; ventral 1 4/5, rays 4 to 6; least depth of caudal peduncle 1 1/3 in eye.

Blackish brown, light brown on areas where skin torn away. Iris neutral dusky. Fins largely whitish, dorsal and anal with dark brown anteriorly.

Pacific Ocean.

75803 U. S. N. M. Monterey Bay, California, Albatross.

Station 4540. Length 72 mm. Type of Zastomias scintillans.

Aristostomias tittmanni Welsh

Aristostomias tittmanni WELSH, Proc. U. S. Nat. Mus., vol. 62, art. 3, 1923, p. 3, fig. 2. From 115 miles east of Cape Hatteras, 100 meters. -- REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep. No. 6, March 10, 1930, p. 140, figs. 135 and 136 (N. 8° to 37° W. 25° to 83°, 40 to 2000 meters).

Depth 6 1/2; head 3 1/5, width 4. Snout 3 1/4 in head; eye 5 1/2, 1 2/3 in snout, 1 1/5 in interorbital; maxillary extends 2 3/4 eye diameters behind eye length but slightly less than head; teeth unequal, upper with 2 pairs of long, hollow, terminally barbed canines, followed by 5 pairs of much smaller terminally recurved teeth, then 12 pairs of straight recumbent teeth; lower teeth with 2 pairs of large and 5 pairs of smaller blade like terminally barbed teeth, first 2 pairs fitting in grooves on side of snout where mouth closes; palatines with 4 small teeth each side; tongue with 2 groups of strong retronse teeth, barbed inserted behind eye, 1 3/4 in combined head and body to caudal base, simple, filamentous, ends in smooth, ovoid knob; interorbital 4, convex.

No gill rakers.

White avoid luminous body in slit like socket close behind and below eye. Lateral photophores in 6 linear groups from pectoral to ventral, 4, 3, 3, 3, 3, 4, then group of 3 and 8 single more or less equidistant to vertical of anal origin where row ends in group of 4; lower on ventral photophores with 6 clustered groups of 2 to 4 each from pectoral to ventral, then 5 linear groups of 2 to 4 each above anal origin, single row of 11 photophores over anal base to end of caudal peduncle.

D. 22, fin height 2 2/3 in head; A. 24, fin height 3; caudal 2 1/3, lower lobe longer; pectoral 2 4/5, rays 3, 5 or 8, filamentous; ventral 1 4/5, rays 6; least depth of caudal peduncle 1 1/3 in eye.

Very dark sooty brown, almost black, finely sprinkled with minute white granulations. Suborbital luminous body yellow, postorbital white. Barbel white, with series of minute black dots, bulb and barbel tip yellowish. Dorsal and anal black basally. Caudal and pectoral whitish, ventral rays dotted with black.

Atlantic Ocean.

84290 U. S. N. M. 115 miles east of Cape Hatteras. Grampus (Bache) Station 10161. In 100 meters. January 28, 1914. Length 46 mm. Type.

Aristostomias xenostoma Regan and Trewavas

Aristostomias xenostoma REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No. 6, March 10, 1930, p. 139, pl, 13, fig. 3, text figs. 133 and 134. N. 8° to 17° W. 30° to 64°, 300 to 4000 meters, Western Atlantic and Caribbean Sea. -- NORMAN, Discovery Rep., vol. 2, 1930, p. 317 (S. 3°6' 30" W. 3°53', 102 meters).

Depth 4 2/3 to 6; length 3 1/3 to 4 1/2. Snout 2 2/3 to 4 in head; eye 3 1/2 to 4 2/5; barbel 1/10 to over 1/2 fish, ending in small white bulb, broader basally (adult) or terminally (young).

Subocular luminous organ little short or nearly long as eye, 4 to 7 times postocular organ (5 to 8 times in young); sometines few bluish spots below subocular organ. Lateral photophores 14 to 18 between gill opening and ventral, first 3 or 4 rising in obliquely, rest in groups of 2 to 4; 14 to 16 between ventral and anal, in groups except sometimes 3 to 6 spaced in middle of series (4 to 9 in young). Ventral series 5 and 3 between isthmus and pectoral; 14 to 17 between pectoral and ventral, in 5 or 6 groups of 2 to 4 close set spots; 15 to 18 between ventral and anal in similar groups; 9 to 11 between anal and caudal.

D. 21 to 23; A. 26 to 29; pectoral 6 to 9; ventral 6, median. Length 112 mm. without caudal. (Regan and Trewavas.)

Atlantic; Caribbean Sea.

Genus Malacosteus Ayres

Malacosteus AYRES, Boston Journ. Nat. Hist., vol. 6, Sept. 1849, p. 53. Type Malacosteus niger AYRES, monotypic.

Body compressed. Head rather compressed. Snout blunt, short. Eye far forward, at front end of snout. Mouth cleft extremely wide, jaw bones and preopercle greatly prolonged to form an enormous gape. Premaxillary teeth small, fixed. Maxillary teeth minute, oblique, or absent. Lower jaw with 4 or 5 enlarged, fixed fangs, barbed at tips with smaller fixed teeth between and behind. Palate toothless; 10 to 12 pairs in 4 groups on basibranchials, rudimentary or absent on gill arches. No barbel. Gills 4. Gill filaments very short. Branchiostegals 8, extremely short, rod like, cartilaginous. Large subocular luminous organ below eye, pointed anteriorly; small double organ above its hind end postocular luminous organ well behind eye. No photophores on branchiostegal membrane and no serial photophores on body. Dorsal and anal origins opposite, with deep muscular bases and think blackish fin membranes. Pectoral small, rays 3 to 5. Ventral rays 6, postmedian.

Analysis of species

a[1]. Postocular luminous organ over 1/4 of eye; subocular luminous patch long as eye, more than twice long as deep.

b[1]. Head 3 3/4 to 3 4/5. ---------- niger.

b[2]. Head 3 1/2. ---------- indicus.

a[2]. Postocular luminous organ smaller, less than 1/4 of eye; depth of subocular luminous patch 1/2 diameter of eue; head 3 2/5 to 3 2/3.

danal.

Malacosteus niger Ayres

Malacosteus niger AYRES, Boston Journ. Nat. Hist., vol. 6, Sept. 1849, p. 54, pl. 5. West Atlantic in N. Lat. 42°, W. Long. 50 . -- GÜNTHER, Cat. Fishes Brit. Mus., vol. 5, 1864, p. 428 (compiled); Rep. Voy. Challenger, vol. 22, 1887, p. 214, pl. 54, fig. C (copied). -- GOODE and BEAN, Oceanic Ichth., 1895, p. 114, pl. 37, fig. 138, (off Barbadoes, 347 fathoms, N. 37 to 39 W. 71 to 73 , 541 to 1064 fathoms). -- JORDAN and EVERMANN, Bull. U. S. Nat. Mus., No. 47, pt. 1. 1896, p. 593 (copied). -- GUGMAYER, Res. Camp. Sci. Monaco, vol. 35, 1911, p. 68, pl. 3, fig. 2, (N. 37 10' W. 11 48', 4750 meters: N. 36 6' 40" W. 10 18', 4740 meters). -- MURRAY and HJORT, Depths of the Ocean, 1912, p. 612, (N. 31 20' W. 35 7', 3886 meters, south of Azores). -- ROULE, Res. Camp. Sci. Monaco, wol. 52, 1919, p. 26, (N. 37 57' W. 27 47' 45", 1748 meters). -- PARR, Bull. Bingham Oceanogr. Collection, vol. 3. are. 3, Dec. 30, 1927, p. 99 (text fig. p. 11) (N. 21 to 32 W. 64 to 77 , 7000 to 10000 feet). -- REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No. 6, March 10, 1930, p. 142, fig. 138, (N. 8 to 35 W. 7 to 70, 1600 to 7000 meters). -- NORMAN, Discovery Rep., vol. 2, 1930, p. 317, (S. 33 to N. 13 E. 4 to 16 to W. 21, 625 to 2000 meters).

Malacosteus choristodactylus VAILLANT, Exped. Sci. Travailleur et Talisman, Poiss., 1888, p, 108, pl. 8, fig. 4. Coast of Morocco and Azores, 1400 to 2220 meters. --MURRAY and HJORT, Depths of the Ocean, 1912. p. 612, (Gran Canaria to Fayal, Azores, 1235 to 3886 meters).

Malacosteus indicus (not GÜNTHER)

ALCOCK, Ann. Mag. Nat. Hist. Series 6, vol. 4, 1889, p. 452 (Andaman Sea, off Cinque Island, 650 fathoms). -- GOODE and BEAN, Oceanic Ichth, 1895, p. 114 (reference). --ALCOCK, Journ Asiatic Soc. Bengal, vol. 65, pt. 2, 1896, p. 334, (reference). -- BRAUER, Deutsch. Tiefsee Exped. Valdwia, vol. 5, Tiefsee-Fische, 1906 p. 65, text figs. 23-25. (luminous organ and head) (north of Cocos Island, Bay of Bengal, Chagos Island, West Africa, 1900 to 2500 meters). -- MURRAY and HJORT, Depths of the Ocean, 1912, p. 612, (Gran Canaria to Fayal, Azores). -- WEBER and BEAUFORT, Fishes Indo Austral. Archipelago, vol. 2, 1913, p. 118, fig. 43 (compiled). -- GILCHRIST, Fisher Marine Biol. Surv. South Africa, Report No. 2, 1921, (1922). No. 3, p. 54, (off Cape Point, in 1014 fathoms). -- BARNARD, Ann. South African Mus., vol. 21, pt. 1, June 1925, p. 139, pl, 7, fig. 5, (compiled).

Malacosteus sp. ALCOCK, Cat. Deep Sea Fishes Indian Museum, 1899, p. 149, (Andaman Sea Example); Illustrat. Zool. Investigator, pt. 7, 1900, pl. 33, fig. 4.

Jordan designates Cheilobranchus dorsalis Richardson for Alabes Oken, Isis, 1817, p. 1182, a later reference than Cloquet. Although I have admitted Alabes cuveriae Mc Clelland as it is only printed once in his paper referred to, perhaps even intentional, though of course an error in comparison with the correct form as written by Vaillant.

Depth 5 3/4 to 6; head 3 3/4 to 3 4/5, width 3 to 3 3/4. Snout 11 to 12 in head; eye 5 1/4 to 6, twice or more than snout as seen in profile, 1 2/5 to 1 1/2 in interorbital; maxillary extends 3 2/3 to 4 1/5 eye diameters behind eye, 1 1/8 in head; 3 pairs of short wide spaced upper canines with many shorter uniform uniserial teeth; 4 pairs of longer wide spaced lower canines with many shorter uniform uniserial teeth, second pair longest; interorbital 4 to 4 2/5, well convex. No gill rakers; gill filaments 1 2/3 in eye.

Ovoid or crescentic luminous body below and posterior to eye, close aboce maxillary and smaller one little posterior. Photophores of body very minute and inconspicuous.

D. 19, fin height 2 1/8 to 2 2/3 in head; A. 20, fin height 2 to 2 4/5; caudal 3 1/8 to 4, small, deeply emarginate; pectoral 1 1/2 to 2 3/4, rays 3 or 4; ventral 1 2/5 to 2 1/5? rays 5; least depth of caudal peduncle 1 3/4 in eye.

Uniform black. Luminous bodies on cheek below and behind eye white. Fins all black.

Atlantic and Indian Oceans

32169 U. S. N. M. Georges Bank. Schooner A. Wonson. Gloucester Donation 797. Length 125 mm. In poor preservation.

35526 U. S. N. M. N. 39°35' W. 71°18'. In 1064 fathoms. Albatross Station 2211. Length 100? mm., specimen distorted.

39220 U. S. N. M. N. 37°46' 30" W. 73°56' 30". Albatross Station 2742. Length 160 mm.

44580 U. S. N. M. N. 39°5' 30" W. 72°23' 20". In 541 fathoms. Albatross Station 2548. Length 108? mm. Very poorly preserved.

89916 U. S. N. M. N. 35°50' W. 63°55'. Museum Camp. Zool. No. 11. Length 86 to 90 mm. 2 examples.

Malacosteus indicus Günther

Malacosteus indicus GÜNTHER, Ann. Mag. Nat. Hist., series 5, vol. 2, 1878, p. 181. Pacific Ocean near Philippines, 500 fathoms; Rep. Voy Challenger, vol, 22, 1887, p. 214, pl. 54, fig. 13 (type). -- REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No. 6, March 10, 1930 p. 143 (type).

Depth 7 1/2; head 3 1/2. Eye 5 in head.

Depth of subocular luminous patch 1/2 of eye. Postocular luminous organ more than 1/4 of eye.

D. 20; A. 20; Pectoral 3; ventral 6, postmedian. Length 106 mm. without caudal. (Regan and Trewavas.)

Philippines.

Malacosteus danal Regan and Trewavas

Malacosteus danal REGAN and TREWAVAS, Danish Dana Exped. Oceanogr. Rep., No. 6, March 10, 1930. p. 143, pl. 14, fig. 1. N. 7°30' W. 79°19', 3500 Meters; N. 7°15' W. 78°54', 3500 Meters, Gulf of Panama.

Depth 7; head 3 2/5 to 3 2/3. Eye 5 in head.

Subocular luminous patch long as eye, more than twice long as deep Postocular luminous organ 1/4 of eye.

D. 19 to 21; A. 20 to 22; pectoral 3 or 4; ventral 6, median. Length 146 mm. without caudal. (Regan and Trewavas.)

Gulf of Panama.